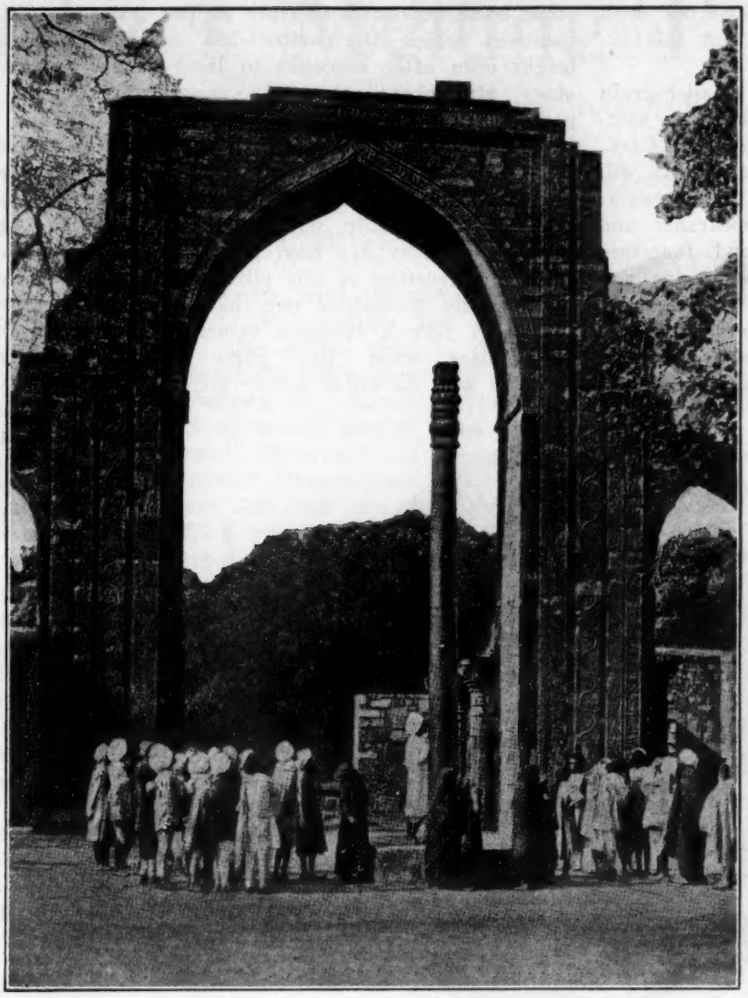
THE iron pillar of Delhi, India, has stood for 1600 years, seemingly rustless, a metallurgical "mystery"



ON THE following page is reproduced the first photomicrograph ever made of iron from this great relic

Science Analyzes the Iron Pillar of Delhi

By Sir Robert Hadfield

THE metallurgy of iron and steel dates back to the very earliest time. The writer on various occasions has dealt at some length with the early history of iron, and, in particular, has written on the subject of that remarkable example of primitive metallurgy, the iron pillar at Delhi. The origin of the pillar dates back to about the year 300 A.D. Samples taken for me from the pillar show the following analysis and composition: Carbon, 0.08; silicon, 0.046; sulphur, 0.006; phosphorus, 0.114; manganese, nil; and nitrogen, 0.030 per cent; total 0.276 per cent; iron 99.700 per cent; total 99.976 per cent. The specific gravity is 7.81, and the ball hardness number is 188.

The iron pillar is indeed a marvelous production. In those days there were no steam hammers or presses with which to produce heavy iron forgings. Its total length is 7.22 meters, the height above ground being 6.71 meters; the upper diameter 31.8 centimeters; the lower diameter 41.9 centimeters; total weight 6000 kilograms.

The fact that its largest section is no less than 41.9 centimeters in diameter makes it all the more difficult to explain how this pillar was made. If built up of sections it would be no easy matter to weld this diameter and large cross-sectional area. However, there stands the pillar in one long length, namely about 7.22 meters from bottom to top. Moreover, about 1.25 meters at the top of the pillar is most beautifully carved in different fluted forms. It was somewhat difficult to prepare a section from which to obtain a photomicrograph from the specimen, which is only of very small size, taken from the Delhi pillar. However, the trouble was surmounted, the result being shown in the accompanying photomicrograph of the specimen, enlarged with 50 magnifications.

The microstructure consists of large grains of ferrite with a small amount of cementite in some of the grain junctions. A smaller grain structure within the large grains is faintly developed by the etching reagent. Within the grains are innumerable small lines, whose nature is rather obscure. The appearance of these lines much resembles those due to nitride, but by chemical analysis

Abstract of part of a paper read before the French Congress of Chemical Industry, in Paris, Oct. 5, 1925.

nitrogen was proved to be present only to the extent of 0.03 per cent, thus conclusively ruling out this explanation.

The lines and also the smaller grain structure no longer appear after heating the specimen to 900 degrees Cent., and cooling in the furnace. It will be noticed that the large ferrite grains are quite normal in appearance and free from distortion, and therefore the structure within the grains can scarcely have been due to cold work, thus disposing of another possibility.

It is noteworthy that very little material in the form of silicates is present. This is interesting in view of the conversation the author had not long ago with one of the leading metallographic experts in England, who suggested that the resistance to corrosion exhibited by this pillar might have been aided by the presence of slag, which would if present be revealed by the micro-examination.

From the photomicrograph, which is representative of the material, the metal is seen to be remarkably free from inclusions, that is free from slag, or other intermingled matter. Therefore, the specimen, although containing 0.114 per cent phosphorus evidently is a very pure iron in every other respect.

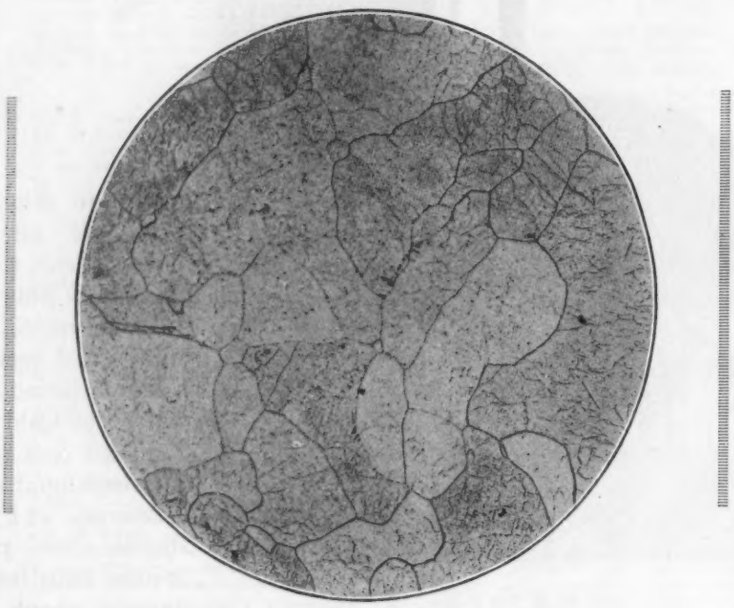
The significance of the peculiar microstructure and of the resistance to corrosion of the pillar are interesting problems. It has been said by some that the pillar would rust, even in the dry climate of Delhi once the outer surface was broken. On the other hand the small fracture of the specimen which the writer has is bright even after exposure to laboratory atmosphere, though a small portion covered with water, and left overnight was badly rusted in the morning. The etched microsection also quickly commenced to rust, but that can be readily understood.

Another theory has been presented for the nonrusting of this pillar, but it is hardly a credible one, namely, that each year a religious ceremony takes place, when the pillar is anointed with an edible matter known as "butter," and that this fatty matter has protected the pillar from rusting. The author puts forward this statement with all reserve because he has not yet been able to check whether the practice in question does occur, but is making inquiries to determine if there is any foundation for the statement.

In any case, the fact that this large column of wrought iron has been in existence for some 1600 years, and still stands in perfect condition, is very remarkable.

It may be mentioned that this is the first time there has been prepared and presented to a scientiific body an actual photomicrograph from this ancient pillar of iron. It may be said that the photomicrograph is unique, and that it represents the first modern examination of iron having an age of no less than 1600 years. In papers read before the Royal Society and the Iron and Steel institute in 1912 the writer described early specimens of Singalese iron and steel preserved in the Colombo museum, Ceylon, and dating back to the twelfth and thirteenth centuries. So far as mediaeval times are concerned, it has become almost a certain tradition to make passing references to Georgius Agricola whose work "De Re Metallica" was first published in 1556. My own copy is the later illustrated edition printed by Emanuel Konig at Basle in 1657. On page 343 of this edition occurs the following earliest description of a curious old process for making steel:

"Pieces of the most fusible iron were introduced into a large crucible in the hearth of the iron furnace along with a mixture of flux and charcoal. The action of the bellows was directed so as to produce fusion. When this was accomplished four pieces of bar iron, weighing about 30 lbs. each, were introduced into the crucible where they remained for five or six hours. During this time the bars absorbed the melted iron and became enlarged, soft and pasty. A trial was then made of one of the bars, the furnace men placing it under a forge hammer, where it was forged. The hot bar was then quenched and the fracture examined to see if it was converted into steel."



The new and the old in metallurgy; first photomicrograph of iron from the pillar of Delhi; a gulf of sixteen centuries between the making of the iron and the making of this photograph.

Dr. Sauveur To Lecture

Dr. Albert Sauveur, holder of the Gordon McKay professorship in metallurgy and metallography at Harvard engineering school, has been engaged by President Thomas S. Baker of Carnegie Institute of Technology to deliver three scientific lectures at Pittsburgh on Nov. 30, Dec. 1 and Dec. 2. The subjects are "Directional Properties and Dendritic Segregation in Steel," and "Hardening of Steel," two lectures being given on steel hardening. These lectures will be given in the evening for the benefit of Pittsburgh scientists and steel men.

Acquires Hydro Rights

Information to the United States department of commerce, states that Compania Electro-Siderurjica e Industrial de Valdivia, organized by Chilean engineers and capitalists in April, last year, has acquired hydroelectric rights under which the entire steel plant will be operated by electricity. The company expects to establish a hydroelectric station of 32,000 horsepower and agrees to produce up to 50,000 gross tons of iron and steel each year.

Standardizes Melting Practice

Factors in Securing Long Life for Refractories and Methods Followed in Relining Sides, Bottoms and Covers of Acid Electric Furnaces Are Considered—Log of Heat Is Presented in Detail

By A. W. Gregg and N. R. Knox

WHEN the 1½-ton furnace at the plant of the Bucyrus Co., South Milwaukee, Wis., originally was lined in 1922, a bottom contact for the electrodes was made with broken pieces of carbon and with a low power input the refractories were brought to the glazing point. This was continued about 12 hours, adding an inch of silica sand to the hearth about every two hours until we had a bottom consisting of two courses of brick, a few inches of rammed ganister and 5 inches of fused silica sand. This bottom never has been removed.

Relining the furnace is done Saturday or Sunday. A furnace roof or lining never is used after it is reduced to 3 or 4 inches of thickness. Heat losses become excessive when the lining reaches this point and the added power cost entailed to produce hot steel far outweighs any further saving in refractory cost by a run of another week or two.

On a lining job, for example, the last heat is tapped at 11:30 a. m. on a Saturday. As soon as the heat is out, the roof is removed by the crane. An air hose is turned into the shell and compressed air left blowing for an hour. Then the lining is knocked in with crow-bars. The hearth is cut and trimmed with air hammers until its rim forms a circle 13 inches from the furnace shell. The debris then is dumped and swept out and at about 2:30 p. m. the relining is started. Thirteen inches of special shaped silica brick are used. These are laid loosely and the cracks between each brick and between the brick and furnace shell are filled with loose silica sand. On the top course is placed 2 inches of a ganister mixture bonded with fire clay and molasses water. The new roof then is set in position. This ganister mixture forms a seal between roof and lining. The furnace then is charged for the first heat to be run on Monday. On top of the charge is dumped a wheelbarrow load of charcoal. This is ignited and dries out the brick during the week-end. This complete cycle usually is started at noon and the gang goes home at 7 p. m. with the job completed.

Roofs Are Dried Thoroughly

In laying the furnace roof, which also consists of special shapes, shingles as expansion wedges are inserted every third brick around the entire ring. These roofs remain on top of a mold-drying oven during the next run of the furnace, which is usually three to four months. This practice is a great insurance against spalled brick. The usual position for the roof is 21 inches above the door sill or bath level. Our practice is to raise it 1 foot higher and to this end we have bolted an extra ring on top of the shell. This position is the most economical from the point of power consumption, refractory life and ease of operation for the melter, i. e., when running 5000 to 7000 pound heats.

The first heat from a new lining is melted, refined and poured with the use of the low-voltage tap only. This prevents spalling the brick. After the first heat, the furnace is run as fast as desired.

Refractory results obtained by the foregoing practice follow:

Average roof life, last 10 months—1691 tons. Tons per roof—highest 2362—lowest 1182 tons.

Average lining life, last 10 months—913 tons. Tons per lining—highest 1182—lowest 979 tons.

The only patching ever done during the life of a roof and lining consists of crawling in the furnace every Monday morning and mudding up the joint between roof and side walls.

As previously stated, our electric furnace has a rated capacity of 1½ tons. Under normal operation our standard heat is 6700 pounds. When pushing the furnace to the limit a charge of 6200 pounds gives maximum tonnage with greatest ease of operation. For example: In 24 hours nine heats of 6700 pounds, or a total of 60,300 pounds are tapped, but with a 6200 pound charge ten and sometimes 11 heats of 62,000 pounds in the first case and 68,200 pounds in the second case are poured. Large heats are

From a paper presented before the American Foundrymen's association, Syracuse, N. Y. Oct. 5-9. The authors, A. W. Gregg and N. R. Knox, are associated with the Bucyrus Co., South Milwaukee, Wis.

Table I

Data Exchange Report

	Net tons Per month	K. w. h. Per net ton	K. v. a. demand	Time per net tons in hours	Net tons per roof	Net tons per side wall	Electrodes Pounds carbon per ton	Electrodes Pounds graphite per net ton	Charge Per heat net ton	Time power Off to on between heats minutes per heat	Furnace rating
Ideal	350	550	950	.60	900	1250	12	6	2.5	4	330
Sept.	668	538	944	.68	....	....	9.67		3.06	5	363
Oct.	647	580	1008	.70	1530	979	9.19		3.06	5	406
Nov.	567	562	950	.68	....	439	9.00		3.06	5	382
Dec.	572	553	912	.68	....	....	9.00		3.04	5	375
Jan.	584	503	1004.8	.65	....	....	8.40		3.05	5	113
Feb.	587	588	952.1	.65	2362	1053	9.50		3.10	5	219
Mar.	671	506	951	.65	....	....	8.30		3.25	5	232
Apr.	624	530	940	.65	1182	1182	8.70		3.33	5	160
May	624	533	953	.65	....	....	8.50		3.23	5	158
June	702	506	964.6	.63	....	....	8.50		3.18	5	160
Ave.	624.6	539.9	962.2	.65	1691	913	8.87		3.13	5	

$$100\left\{\frac{\text{Roof } 900+ \quad \text{Lining } 1250+ \quad \text{Charge } 2.5}{\underset{\text{K.w.h.}}{550+} \quad \underset{\text{Demand}}{950+} \quad \underset{\text{Time}}{600+} \quad \underset{\text{Carbon}}{12+} \quad \underset{\text{Time Charge}}{4}}\right\} = 142$$

impossible when starting on a new lining. At such times heats of 4500 pounds are charged and each heat is increased 500 pounds until the standard is reached. By a judicious use of crushed limestone or mill scale to cut the hearth to its proper bowl shape, the objective is reached a day after the new start.

The larger charge, aside from being preferred by the furnace crew because it cuts labor almost in half, is much easier to run accurately due to the slower reactions in a large body of metal, and it also permits greater economy of operation than with a smaller heat of say 3500 pounds. In addition, it is more convenient for the molding floor to pour a large heat every two hours and 20 minutes instead of a small one every hour and ten minutes. Following is the log of our average 6200 pound heat with appropriate explanation.

A heat has just been tapped. The hearth and slag line are inspected for holes. If there are any they are filled with damp silica sand. The tapping door is sealed from the charging side with two or three shovels of foundry sand. This is necessary with large heats and in addition saves the door bottom from burning away. The doors are lined with rammed ganister. With the tapping door sealed and the electrodes as high on the masts as they will go, charging is started. This is done by hand as we never have found a chute practical in charging oversize heats. The charge consists of 1100 pounds of foundry scrap, 1500 pounds of plate scrap and 3600 pounds of machine or axle turnings. The charging door is banked up half way with silica sand, the furnace tipped slightly forward and the power is turned on. The usual time from power off to power on is 15 minutes.

10:00 a. m. Power on.
10:00-11:15 Melting down—high tap 135 volts.
11:15 Power off. Scrap melted and a bath of metal 6 inches deep formed. Three shovels of used sand blast sand added for slag. *Note*—When running a furnace 100 per cent overload it cannot be expected that the charge will melt from the bottom up as is ordinarily the case. The bath forms from the top and works downward. Punchings are to be especially avoided in charge of this size as they invariably form slugs difficult to get off the bottom. Fine turnings give the same result.
11:16 Power on. Low tap. 90 volts. *Note*—As soon as a bath is formed the furnace is put on low tap and left there. The use of high tap and the consequent long arc at this stage is the cause of poor refractory life.
11:30 All scrap melted off the bottom.
11:40 Spoon test. Two taken. One broken and fracture read by melter. The other sent to laboratory for analysis to confirm melter's judgment. *Note*—It is our aim to have the first test read about 0.24 carbon. This we accomplish by charging 100 pounds of ore. This also promotes the desired boil. From the first test the carbon will drop two to four points by the time the heat is ready to tap. The manganese addition brings the heat back to a final of 0.25 or 0.26 carbon. Our range is 0.24 to 0.30. If the carbon is too low and the bath is cold, we add pig iron. If the bath is hot we dip the electrodes i. e., one electrode immersed 1 inch for one minute gives approximately one point of carbon. Actually, it is largely a matter of judgment of bath temperature as to how much carbon will be picked up by this method.
11:47 Another shovel of sand added to slag. Bath quiet. Slag giving off large bubbles.
11:55 Laboratory check satisfactory. Spoon test poured for temperature satisfactory. Manganese added in furnace. Bath dead.
12:00 Silicon added in ladle. Heat tapped.

Every heat, including alloy steels, is held to the previously mentioned practice as closely as possible. The tables show the results obtained. Table I shows ten months operation of the furnace. Table II shows results obtained over a period of one week when the furnace was being pushed to capacity.

Table I is a copy of reports furnished to the manufacturer of the furnace. We report our monthly figures and four times a year the furnace corporation compiles a sheet showing the results obtained by each operator. The various companies are designated by letters and are unknown to each other. An arbitrary rating is used to place the furnace in the approximately correct sequence, according to their efficiency of operation. The rating formula will be explained later.

Column 1 shows the tons charged; column 2 the kilowatt hours per ton. The apparent variation from month to month may be disregarded as it depends largely on when the power company reads the meters. Our average is 539.9 kilowatt hours per ton. Column 3 shows the demand charge. The kilowatt ampere figure that is desired should be given consideration. On small tonnage and intermittent operation these figures should be kept as low as is feasible. But where a reasonable output may be expected, it is an unfair handicap to a melter to limit him too closely. He is unable to run his furnace efficiently and consequently cannot show economic operation. The foregoing statement should not be taken as advice for an unlimited demand rate. Every user should determine his proper figure aided by the furnace manufacturer and the power company.

The authors have seen furnaces where the melter was required to keep his demand so low that a heat that should have taken two hours took four and one-half hours. The added kilowatt hour input under this sort of operation far outweighs the saving in demand. The demand rate usually is measured over a 15 minute period and we have found it most economical to fix the point at which, with the furnace pulling its heaviest load, we never have to shut off more than one minute in every 15. This shutting down occurs only when the furnace is on high tap.

The time per net ton in hours is

Table II

Furnace Performance

JUNE 15-20, 1925

Heats	62
Pounds charged	381,974
Tons charged	190.98
Kwh used	32,664
Kwh per ton	526.8
Hours elapsed time	144.58
Average time per heat	1 hour 57 Min.
Hours melting time	121.87
Pounds electrodes per ton	8.5
Pounds good castings	228,000
Tons good castings	114
Per cent good castings of metal charged	59.5
Tap to tap—time	2 Hours 20 Min.

Table III

Conversion Cost

DOLLARS PER MONTH

	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
Metal cost per ton charge	14.71	19.29	13.60	15.15	16.99	17.60	15.26	16.23	14.63	13.65	15.20
Melting, including charging, melting and ladle lining	2.20	2.24	2.42	2.26	2.34	2.44	2.12	2.58	2.40	2.28	2.32
Power per ton charge	5.38	5.72	5.77	5.65	5.44	5.87	5.17	5.46	5.48	5.19	5.51
Electrodes per ton charge	.77	.74	.72	.72	.67	.76	.66	.70	.68	.68	.71
Lining refractories per ton, including labor	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.08
Roof refractories per ton charge, including labor	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.04
Total conversion cost	8.47	8.82	9.03	8.75	8.57	9.19	8.07	8.86	8.68	8.27	8.66
Conversion plus metal	23.18	28.11	22.63	23.90	25.56	26.79	23.23	25.09	23.31	21.92	23.86

shown in column 4. This is an item that calls for judgment and experience. Do not urge the furnace operator to run too fast. To keep a heat too long in the furnace is wasteful of power, but to keep it not long enough is to produce inferior steel. Columns 5 and 6 show roof and lining life. Good refractory life depends on not overheating the furnace, not laying up the bricks too tightly and the minimum use of fluorspar and lime. Column 7 shows electrode consumption per ton of charge. Column 9 shows charge per heat. As previously mentioned a charge of 3 tons is the most economical one for a 1½-ton furnace.

Column 10 shows time between heats. It is axiomatic that the less time there is between heats the higher the efficiency shown by the furnace. The deciding factor, however, is the tonnage required. Running single or double turn with a well-trained furnace crew, we average 15 to 20 minutes between heats, power off to power on. This is dependent on the amount of patching which may be required by the hearth.

A charging chute or box is a time and labor saver, especially the latter, if the charge is not much larger than the rated capacity of the furnace. But when 50 per cent of the charge is turnings and the total is more than double the furnace standard, hand charging is the only possible method. During the warm months our furnacemen charge under a blast of compressed air which blows the heat away from them. This air blast affords tremendous relief and prevents complete exhaustion. The device employed is merely a 3-foot length of 1-inch pipe with ⅛-inch holes drilled in line every two inches along its length. The pipe is supported by 2-foot standards and is parallel with the floor. An air hose is attached and during the charging period a sheet of cool air is blown over the men in the direction of the furnace.

Efficiency rating is shown in Column 11. This is an arbitrary rating devised merely to group the various furnaces in some relation to each other as regards effciency of operation and thereby perhaps instill a mild spirit of rivalry. At first this rating was figured by multiplying kilowatt hours per net ton by time per net ton in hours. This method, however, disregarded so many items of importance necessary to the proper operation of a furnace, i. e., refractory life, electrode consumption, etc., that after some consideration we suggested a new formula embodying all items of importance. The furnace company accepted this and has put it in use. The formula consists of an equation in which the sum of all items that should be as large as possible, i. e., refractory life and charge, is divided by the sum of all items that should be as small as possible, i. e., kilowatt-hours, demand, time per heat, carbon consumption, and time between heats. Tonnage is purposefully excluded, as that is contingent on business conditions and outside the scope of the melters' activities. Of course, the more tonnage available, the better should be the operation of the furnace.

The ideal figures at the top of the chart were set forth by the furnace company as near the ideal, and the attainment of which would indicate excellent furnace efficiency. In reference to the rating formula previously described, the insertion of the so-called ideal figures therein and the multiplication of the result by 100 to give 3 insignificant figures, equals 142. The ideal figures are arbitrary, but they serve their purpose in creating an incentive; 142 is the figure to obtain or surpass.

Metal cost, conversion cost, and total cost of hot metal in dollars per ton of charge, are shown in Table III. The conversion cost has been limited to the main items of interest and importance, i. e., labor, power, electrodes and refractories. Our repairs and maintenance are negligible with the exception that once a year we remove the oil from the transformers, clean the cooling pipes inside and out, inspect and tighten all connections, test the coil, and put the transformer back into service again. This is a safety measure and also prevents overheating during the summer months due to a dirty or insulated cooling coil. Other costs omitted are fuel oil or ladle drying and water for cooling purposes. Water and oil each cost us about 25 cents per ton.

Our metallic charge includes 20 to 25 per cent foundry scrap; 20 to 25 per cent plate scrap, and 50 to 55 per cent turnings, machine and axle, preferably the latter. We consume all turnings produced in our machine shop which amounts to 15,000 to 20,000 pounds per day and this reduces our average metal cost as we get these turnings free of freight and handling charges.

The furnace personnel consists of a melter, a first helper, two chargers and a ladleman. A similar force makes up the night turn. We always endeavor to have a young man in the first helper position capable of learning to run the furnace and he is given the opportunity to show his ability. This even extends in some cases to the chargers and ladleman. Consequently, we have a waiting list of intelligent young men who want to get on the furnace.

Our power cost is decidedly affected by large output and by night and day operation. But also careful charging

Table IV

Physical Properties of Electric Steel

	Analysis					Test Results				
	C.	P.	Mn.	Si.	S.	Yield Point	Ultimate Strength pounds Per Sq. In.	Elongation Per cent in 2 In.	Per cent reduction of Area	Brinell hardness
1 Low Carbon.....	.30	.037	.73	.32	.050	44350	76200	28.	42.5	146
2.....	.28	.030	.71	.32	.049	45250	75550	28.	41.	146
3.....	.25	.040	.70	.32	.057	44150	68550	33.5	52.0	140
4.....	.24	.043	.60	.34	.049	41300	67800	34.	53.9	134
5.....	.29	.032	.91	.27	.056	48150	80550	27.5	45.4	150
1. Alloy A.....	.30	.035	.86	.34	.041	58550	87625	26.	45.4	200
2.....	.31	.030	.84	.40	.040	66850	100800	20.5	42.2	207
3.....	.30	.032	.75	.30	.041	69500	114150	19.	41.9	228
4.....	.31	.034	.76	.37	.045	59150	102650	21.5	36.9	207
5.....	.31	.028	.99	.46	.046	79350	107000	12.	18.8	228
1 Alloy B.....	.27	.039	.78	.47	.039	90450	116600	18.	44.9	
2.....	.46	.040	.78	.60	.035	108500	144750	10.5	18.1	

of a uniform charge, a *standardized method of running the furnace;* proper slag consistency and the obtainance of steel temperature sufficient to pour the work required and no more; all these points have important bearing on power costs, also the elimination of roofs and lining when so thin that radiation becomes excessive.

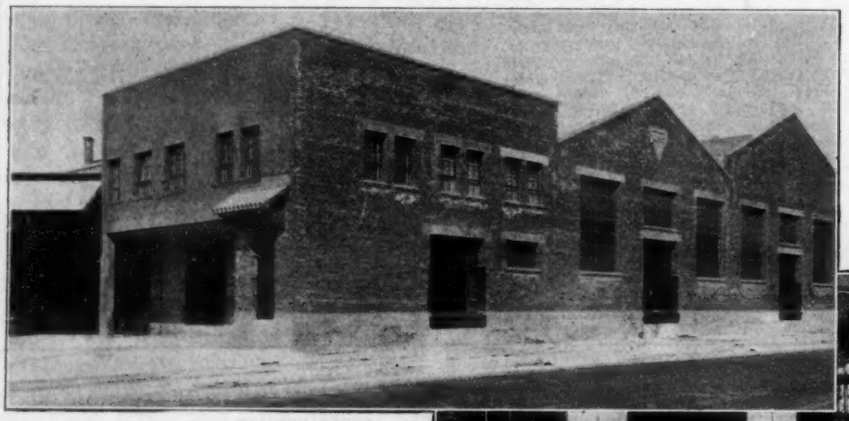
Considerable care is taken to keep electrode consumption per pound to a minimum. The joint compound is kept at the proper consistency and electrodes are joined carefully, not too tight or too loose. The former is liable to cause the nipple to crack off under current load and the latter will cause excessive heating through poor contact. This necks the electrode and increases the possibility of losing the lower half if it receives the slightest jar.

Electrode Position Varies

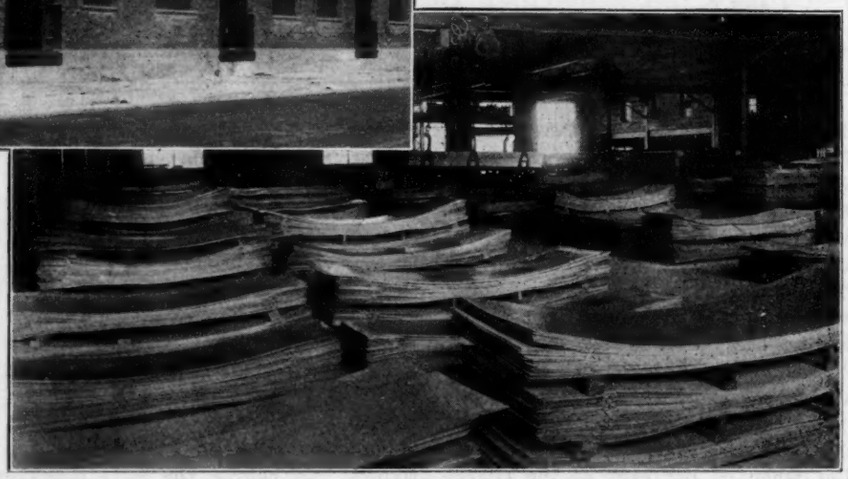
When we run single turn, or shut down the furnace, the electrode arms are as high up the masts as they will go, exposing the hot electrodes to the air so they will cool as quickly as possible. There seems to be some argument as to the best procedure in this effort to reduce oxidation. Some authorities advocate keeping the electrodes down in the furnace and sealing all cracks to prevent drafts. We tried both methods and were convinced that the faster the electrodes cool the more remained to run another day. Running single turn, our consumption is about 2 pounds per ton higher than with double turn, that is, 8½ pounds and 10½ pounds.

The table does not show cost figures month by month. One reason is that the expense is so small that we do not set up a reserve, and the other is that the insertion of a cost of roof and lining in any one month will be incorrect. Consequently, the charges for these two items have been collected and averaged. In an earlier part of this paper our method of operation in relation to roof and lining life was fully explained. It is essential to lay both lining and roof brick so that they have plenty of room to expand. Care should be taken in bringing the refractories up to heat and never to overheat them by running too long on high tap.

Builds Sheet Warehouse on Pacific Coast



(Left)—New iron and sheet warehouse of American Rolling Mill Co., San Francisco



(Below)—A glimpse down the main bay, showing how sheets are stored and handled

American Rolling Mill Co. Erects Warehouse To Give Better Delivery—Capacity is 2000 Tons

AFTER observing the progress of industrial developments on the Pacific coast, executives of the American Rolling Mill Co., Columbus, O., some time ago decided that there was a growing need for iron and steel sheets in that territory. Accordingly, plans were drawn up for construction of a western sheet warehouse at San Francisco, the most central distributive point on the Coast.

This warehouse now has been completed and is situated at 540 Tenth street. The building has a 140-foot frontage on Tenth street, running back to a depth of 155 feet. There are three storage bays available, the main bay being 50 feet wide and 150 feet long. Here is located a 5-ton overhead crane built by the Cyclops Iron Works, San Francisco.

The second largest bay is 50 feet wide by 140 feet long and is served by a single I-beam crane built by the Pacific Gear & Tool Works. The third bay has a 30-foot width by 120-foot length. Handling of sheet stock is accomplished by means of a pack lifter built by the Pacific Car and Foundry Co. Approximately 2000 tons of American Rolling Mill Co. ingot iron sheets are stored in this warehouse. This includes a complete line of galvanized, blue annealed, black sheets, specialty sheets for the enameling trade, auto body sheets, furniture steel sheets, and sheets for stamping and drawing purposes. Exterior and interior views are shown here.

Large Uses of Steel In Small Ways

THE rain, which is a friend of the farmer, is also a friend of the steelmaker. Umbrellas call for a surprisingly large tonnage of steel in their construction. Here, however, as in many other lines, styles change and the quantity of steel used varies accordingly. At present the demand is for short 16-ribbed umbrellas and the steel for these weighs nearly half again as much as the steel used in the umbrellas which were popular early in 1924 which had only eight ribs. Sales records of a prominent eastern manufacturer indicate that 50 per cent of all good grade umbrellas selling at the present time are 20 inches long and have 16 ribs. About 30 per cent are 21 inches long and have 10 ribs, and 20 per cent are 24 inches long and have eight ribs. The cheaper umbrellas are 25 or 27 inches long and have seven, eight or ten ribs.

Government statistics show that the annual production of umbrellas reaches a value of about $26,000,000 a year. With this as a basis a manufacturer who produces a definite proportion of the total, and who has records of his own steel consumption, estimates that the total steel used in the $26,000,000 worth of umbrellas each year weighs more than 4000 tons. Another way to estimate the steel tonnage used in umbrellas is to divide $26,000,000 by the average cost of an umbrella to determine the total number of umbrellas sold. The average cost is difficult to determine, but several authorities have placed it between $2.50 and $3 which would give between 8,000,000 and 10,000,000 individual umbrellas.

The average weight of the steel frame of an umbrella is also difficult to obtain because of the great variety of design. Some umbrellas use a small rod and others a large rod and the number and size of ribs vary. An average lot of frames for 21-inch 10-rib umbrellas gave a weight of 62½ pounds per hundred. The 20-inch 16-rib frames showed an average weight of 75 pounds per hundred, and the 24-inch 8-rib frames of 50 pounds per hundred. Using these figures and the estimated percentage of each style a total weight of approximately 3700 tons results.

The typical umbrella frame consists of a rod of tube steel, of ribs of strip steel, and stretcher members also made of strip steel. The ribs are fastened at one end into a ring which is called a notch, fixed rigidly

Umbrellas

THIS is the fifty-second of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the great American tonnage.

The first article on "corsets" appeared Nov. 22, 1923. Other articles appearing fortnightly since are:

Pins	*Razor Blades*
Cotton Ties	*Pens*
Toys	*Steel Wool*
Spinning Rings	*License Plates*
Card Clothing	*Hypodermic Needles*
Tie Plate	*Shoe Steel*
Tacks	*Crushed Steel*
Knives and Forks	*Skates*
Surgical Instruments	*Needles*
Fence Posts	*Phonograph Needles*
Eyeglass Cases	*Golf Clubs*
Fishing Tackle	*Mechanical Pencils*
Dental Drills	*Burial Caskets*
Pocket Knives	*Telephones*
Rat Guards	*Radio Towers*
Snap Fasteners	*Brushes*
Paper Clips	*Electric Bells*
Steel Vests	*Bookbinder Wire*
Electrical Conduit	*Sucker Rods*
Radiator Furniture	*Watch Hands*
Notebooks	*Steel Furniture*
Metal Beds	*Highway Markers*
Bolts and Nuts	*Camp Cots*
Metal Lath	*Flexible Shaft*
Tin Cans	*Wood Pipe*

HIGH GRADE UMBRELLAS REQUIRE MUCH HAND WORK IN ASSEMBLING—STEEL FRAMES ARE CONCEALED AS MUCH AS POSSIBLE

to the rod, usually by means of a steel pin. The stretcher members, of which there are as many as there are ribs, are fastened at their lower ends to a ring and slide combination which is called a runner. The ring portion of this runner is called a runner notch, the two being fastened together frequently by brazing or soldering. The upper ends of the stretcher members are fastened about midway of the ribs.

While a great many companies make umbrellas, there are relatively few making frames. Therefore the various frame parts are fairly well standardized. Thus rods come in one or two sizes, 4½ millimeters and 7½ millimeters in diameter. The ribs are usually made in the form of a small channel which is rolled from soft cold-rolled strip steel in automatic machines. The strips are fed into the machine at one side and are rolled or formed into the channel which is automatically cut off in desired lengths as it emerges at the other side. These rib channels have not enough depth to allow for the hinge joint with the stretchers so that it is necessary to attach an extra hinge piece to each rib. In some designs of ribs projections or ears are left to form the hinge connection. This, however means that the ribs must be stamped or formed out of wider strips with increased waste. in addition to these the stamping process is more expensive than rolling and so most frames now are made with ribs uniform throughout and hinge pieces are attached. A common form of hinge piece is a two-part stamping which is fastened to the rib in a semi-automatic machine. This machine carries two strips of steel, one above and one below. The rib is then held by the operator in the proper position between the dies and then in one operation small pieces are cut off from both the upper and lower strips, and are formed tightly around the rib in the desired design of hinge.

The stretchers are usually channel shape, similar to the ribs. In fact in most cheaper umbrellas the stretchers are identical with the ribs except for length. The increased number of ribs, however, has developed a new design of stretcher. Instead of channels, flat strips are frequently used, held together in pairs to within a few inches of their outer ends. These flat stretchers frequently are made of spring steel.

Standardizes Working Heights

ASSUMING that machine tool operators should stand on the floor while setting up work and tending their machines, it is important that machine tools should have a definite relation to the shop floor level. This is a truth so self-evident that it should be unnecessary to call it to the attention of anyone. Nevertheless, present day working heights show such a variety that Jerome R. George, vice president, Morgan Construction Co., Worcester, Mass., in an article "Working Height of Machine Tools" appearing in the November issue of *Open Shop Review*, discusses the subject briefly and recommends a set of standards used by his company.

Mr. George states that false floors, platforms or steps around machine tools are objectionable in many ways —they are inconvenient and dangerous for the operator—they make a shop look untidy and increase the difficulty of cleaning the floor. Where operators attend more than one machine and are required to step up and down as they move from one machine to another there is decreased efficiency and increased fatigue. In many cases work will be better done if it is done at a level easily and safely reached by the operator and in all cases it will be done faster and at less cost.

Not only is it important that machines should not be set too low or too high, but that similar tools should be set at a uniform level so that operators going from one tool to anther and from one shop to another will always be working under conditions with which they are familiar. Although Mr. George has the greatest admiration for the designers who have done so much to improve metal working tools during the past two decades, he constantly wonders why so many standard tools still are made to be operated at ridiculous heights.

Machine tool designers seem to give much thought to the placing of control levers at convenient heights, but often entirely ignore the question of whether or not the man who must operate their machine can conveniently set and gage his work. It is equally surprising to observe that users of metalworking tools give so little thought to this important subject and blindly set up their tools in accordance with the recommendations of the machine tool builder, who has probably designed his tools largely to suit his own convenience.

It is Mr. George's experience that a large proportion of standard makes of tools are made too high, particularly the larger sizes, which in some cases are as much as 18 inches too high for convenience and safety. It is also his experience, however, that most makes of modern machine tools if not designed to be properly related to the floor level, can nevertheless be set and operated at the proper level without serious alteration or expense.

In the machine shop of the Morgan Construction Co., it has been found of great advantage to set large vertical boring mills and large planers low enough so that operators can step easily from the floor onto the table.

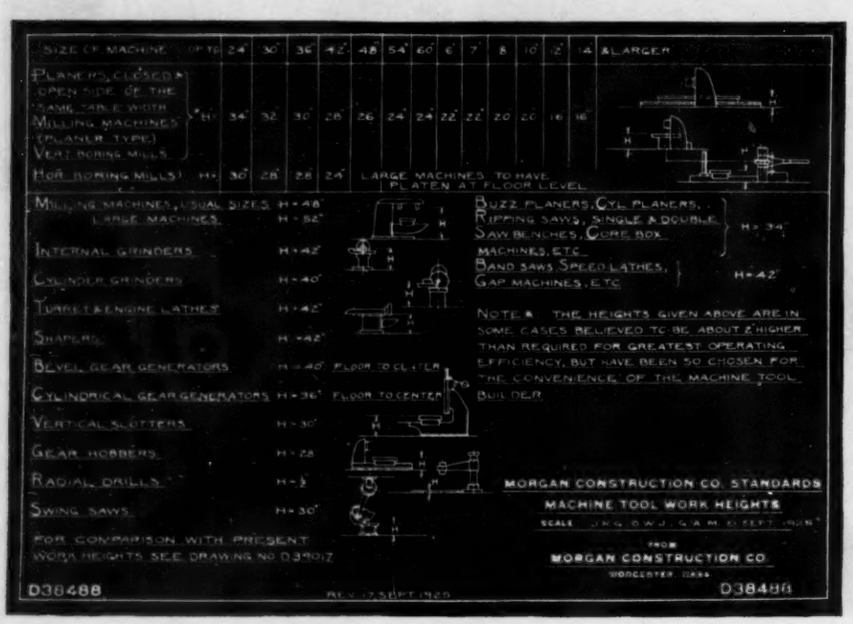

SIZE OF MACHINE UP TO 24" 30" 36" 42" 48" 54" 60" 6' 7' 8' 10' 12' 14' & LARGER
PLANERS, CLOSED & OPEN SIDE OF THE SAME TABLE WIDTH
MILLING MACHINES (PLANER TYPE)
VERT. BORING MILLS
H= 34" 32" 30" 28" 26" 24" 24" 22" 22" 20" 20" 18" 18"
HOR. BORING MILLS H= 30" 28" 28" 24" LARGE MACHINES TO HAVE PLATEN AT FLOOR LEVEL
MILLING MACHINES, USUAL SIZES H=48"
LARGE MACHINES H=52"
INTERNAL GRINDERS H=42"
CYLINDER GRINDERS H=40"
TURRET & ENGINE LATHES H=42"
SHAPERS H=42"
BEVEL GEAR GENERATORS H=40" FLOOR TO CL. ITER
CYLINDRICAL GEAR GENERATORS H=36" FLOOR TO CENTER
VERTICAL SLOTTERS H=30"
GEAR HOBBERS H=28"
RADIAL DRILLS H=
SWING SAWS H=30"
FOR COMPARISON WITH PRESENT WORK HEIGHTS SEE DRAWING NO D39012
BUZZ PLANERS, CYL. PLANERS, RIPPING SAWS, SINGLE & DOUBLE SAW BENCHES, CORE BOX MACHINES, ETC. H=34"
BAND SAWS, SPEED LATHES, GAP MACHINES, ETC H=42"
NOTE * THE HEIGHTS GIVEN ABOVE ARE IN SOME CASES BELIEVED TO BE ABOUT 2" HIGHER THAN REQUIRED FOR GREATEST OPERATING EFFICIENCY, BUT HAVE BEEN SO CHOSEN FOR THE CONVENIENCE OF THE MACHINE TOOL BUILDER
MORGAN CONSTRUCTION CO. STANDARDS
MACHINE TOOL WORK HEIGHTS
FROM
MORGAN CONSTRUCTION CO.
WORCESTER, MASS.
D38488
D38488

CHART SHOWING RECOMMENDED HEIGHTS FOR MACHINE TOOLS

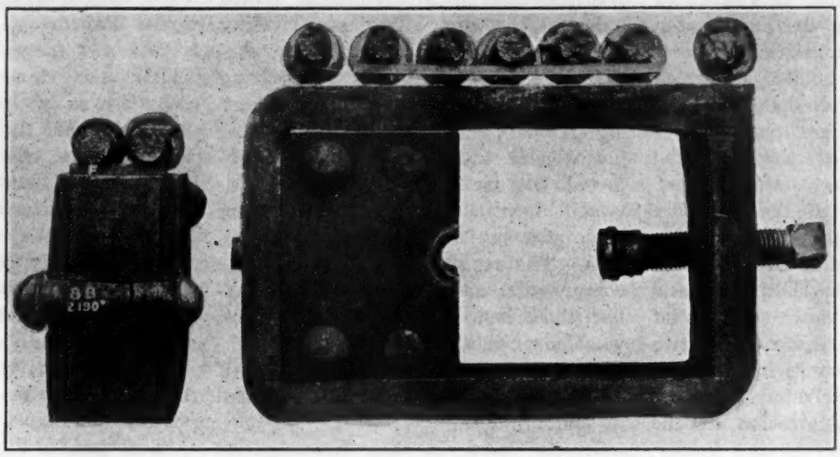


Fig. 1—Device used for testing opposed stresses in driving rivets. After the rivets are driven, the two half sections of the die are opened and the rivet removed for inspection

The broken rivet "F" shown at the extreme left was returned to a rivet manufacturer and is typical of the majority of failures. Other specimens are shown at the top

Heating Causes Rivet Failure

Investigation Shows That Heating to Over 1950 Degrees Fahr. Produces a Structure Unable To Withstand Rapid Alternate Compression and Tension—Different Grades of Steel Are Tested

By A. L. Spencer Jr.

WHEN rivets break in driving or thereafter, if not subjected to severe outside stresses, the general tendency is to place the blame on the quality of the steel or the method of manufacture of the rivets. Chemical, physical and microscopic investigations of the broken rivet samples submitted from time to time by various rivet users have failed, however, to disclose anything in the quality of the steel or in the method of rivet manufacture to account for the failures.

Almost invariably the fractures of sample broken rivets illustrating complaints, show that the failure occured at a comparatively high temperature. The fractures present a dull lusterless appearance with little or no reduction of area. Sample of broken rivet *F* at the extreme left of Fig. 1, is a broken rivet returned to the rivet manufacturer illustrating a complaint and is representative of the majority of failures. In some cases the failure occurs under the head as illustrated by the specimen at the extreme right of Fig. 1.

A specific investigation of complaints on breakage of rivets made at seven different shops, including locomotive, boiler, car and structural fabricators, showed two outstanding conditions in their practice which appeared to be the cause of the breakage. These conditions were high temperature of heating furnaces and stresses during riveting. It is the purpose of this paper, therefore, to discuss these conditions.

The tendency of coal or coke forges used for rivet heating is the inability of maintaining a sufficiently deep bed of fuel with the result that the hot rivet is subjected to the direct action of the flame produced by the air blast and is likely to be overheated or burned in a few seconds under this extremely oxidizing condition. When burning occurs, it is readily apparent, even before the rivet is removed from the fire, by characteristic sparks. Using the electric method of heating, on account of the radiation of heat away from the surface or the chilling effect of the atmosphere, the color of the outside cannot be taken as representing the temperature of the rivet throughout. Unless this difference in temperature between the surface and interior of the rivet is taken into consideration, overheating will result.

Gas Heating Generally Better

The tendency with oil fuel is to use a high pressure air burner frequently connected directly with the line operating the rivet hammers. With an air pressure of 80 to 100 pounds per square inch it is difficult to maintain uniform combustion and constant and proper furnace temperature. It is common practice to employ a furnace of inadequate size, with the result that it must be run at 2400 degrees Fahr. or over to provide for more rapid heating of rivets. When the furnace is of adequate size, often it is overloaded with rivets. In either case, any interruption of the work will result in overheating. A baffle wall, or muffle, seldom is provided between the burner and the rivets and the flame impinges directly on them with resulting harmful oxidation and overheating. Heating with gas fuel is generally better than with oil, coal or coke, due to the low pressure of air employed and the consequent easier control of the furnace temperature.

In commercial shop practice it is a difficult and slow process to fit structural members so that there will be close contact with no looseness or lost motion between the members to be riveted. Where there is lost motion, the rivet will be subjected in driving to compression only. As soon as any looseness is present the rivet is subjected in driving to alternate compression and tension with their accompanying stresses. These stresses generally are termed vibration. The object of this investigation was to determine the separate and combined effect of high temperatures and stresses during riveting.

The testing device shown in Fig. 1

From a paper presented at the annual meeting of the American Institute of Steel Construction at White Sulphur Springs, W. Va., Nov. 11-14. The author is associated with the Pittsburgh Screw & Bolt Co., Pittsburgh.

was made to determine the effect of opposed stresses in driving heated rivets. The device consists of a rectangular frame, or holder, in which is fitted a die made in half sections. These half sections are clamped together by means of the threaded bolt extending through the frame. Through the center of the die is a drilled hole, 13/16-inch diameter, for driving ¾-inch rivets. At the left of the illustration is shown an end view of one of the half sections of the die. The die is made up of two 1-inch plates and two ⅝-inch arched spring steel plates riveted together, as shown in the illustration of the other half die section in the holder. The arch of the spring steel plates is 0.09 inch, or just slightly less than 3/32 inch. The function of the arch is to produce the opposed stresses in driving the rivet.

In conducting these tests, the two half sections of the die were clamped tightly together in the holder by means of the bolt. A ¾x5-inch rivet was heated to the desired temperature and inserted in the central drilled hole of the die. Two air riveting hammers were used in driving. Action in the device during the driving was as follows: Each blow of the riveting hammers flattened the arched spring plates and at the same time, subjected the rivet to compression. Between blows the spring plates sprang back and subjected the rivet to tension. The result was rapid alternate compression and tension stresses. After the rivet was driven, the bolt was loosened, thereby effecting quickly the separation of the two half sections of the die and the removal of the rivet.

Rivets used in the investigation were heated by oil forge, gas forge, coke forge and electric rivet heater. The oil forge was built as a duplicate of one used at a shop where there was a serious breakage of rivets occurring. The hearth was 7 x 9 inches, air pressure 70 pounds, single burner inserted in end, no baffle so the flame impinged directly on the rivets. The flame temperature ranged from 2300 to 2700 degrees Fahr.

The gas forge was a furnace regularly used for forging work. The hearth was approximately five times as large as the oil furnace. The air pressure was low, not exceeding two pounds. There was a baffle wall between the burner and rivets. In these tests the furnace temperature could be easily controlled and ranged approximately the same as the oil furnace. The coke forge was of the ordinary portable type—hand blown. The electric rivet heater was of the type manufactured by the American Car & Foundry Co.

Two grades of steel were employed in making the investigation. One was A.S.M.E. boiler grade, 0.10 per cent carbon steel, and is designed as a type "B" and the other was high sulphur cut thread bolt grade, 0.20 per cent carbon, steel, designated as type "D." Every rivet of each grade broke in driving when heated in the coke forge so as to emit sparks, or to what is commonly termed a "splitting heat."

A. S. M. E. Boiler Rivet Grade "A"

Ladle Analysis:	Car. .11	Mang. .48	Phos. .014	Sul. .033	Elastic Limit Lbs. per Sq. Inch	Tensile Strength Lbs. per Sq. Inch	Elongation in 2" %	Reduction of Area %
As Rolled	Average 5 Tests				30810	53430	41.7	70.3
Heated to 2300° F in 3 Minutes in gas furnace and cooled in air	Average 4 Tests				31400	54360	38 4	68.5

Serial No.	Type of Furnace	Time in Furnace Min.	Sec.	Temperature of Rivet Deg. F				
A- 6	Gas	1	20	1770	.....	.....	....	....
A-12	Gas	1	35	1837	.....	.....	....	....
A-11	Gas	2	0	1917	.... .	.. ..	.. .	....
A- 5	Gas	1	40	2020	. . . .	....	....	. ..
8	Gas	2	30	2060	35320	61300	36.0	68.6
A-14	Gas	2	0	2075	34150	58500	28.0	47.6
A- 3	Gas	2	0	2105	.. .	.. .		....
1-A	Gas	1	50	2115	.....	..	....	....
4-A	Gas	2	0	2115	.....	...	....	.. .
15-A	Gas	2	0	2120	33950	57400	13.0	32.6
2-A	Gas	2	0	2135	31470	51600	7.0	14.8
7-A	Gas	2	40	2145	35940	57000	15.0	18 4
16-A	Gas	2	30	2155	Shearing strength 43850 lbs. per sq. inch			
17-A	Gas	3	0	2165	34570	57720	17.0	25.0
9-A	Gas	2	0	2193	Broke in driving			
10-A	Gas	3	0	2202	Broke in driving			
13-A	Gas	2	0	2238	Broke in driving			

A. S. M. E. Boiler Rivet Grade "B"

Ladle Analysis:	Car. .10	Mang. .33	Phos. .011	Sul. .035	Elastic Limit Lbs. per Sq. Inch	Tensile Strength Lbs. per Sq. Inch	Elongation in 2" %	Reduction of Area %
As Rolled	Average 3 Tests				30890	50800	40.7	71.3
Heated to 2300° F in 3 Minutes in gas furnace and cooled in air	Average 3 Tests				31200	51600	39.7	69.8

Serial No.	Type of Furnace	Time in Furnace Min.	Sec.	Temperature of Rivet Deg. F				
35	Oil	4	0	1755	36020	55040	36.5	73.1
6	Electric	1	30	1800*	38760	57100	36.0	56.6
8	Gas	1	30	1866	38810	49710	40.0	73.1
39	Oil	2	0	1879	Bend 180° Flat			
36	Oil	5	0	1879	34750	48710	40.0	73.3
9	Gas	2	0	1905	40640	54440	34.5	73.8
43	Oil	2	0	1976	Driving continued one minute after color left head			
25	Oil	1	30	1998	39450	54960	30.0	46.5
2	Electric	1	45	2000*	35620	41900	7.0	14.8
9-B	Oil	1	30	2009	Bend test broke short			
26	Oil	1	45	2025	Broke in driving			
27	Oil	2	0	2047	Broke in driving			
7	Gas	1	45	2070	36340	55140	21.5	19.6
3-B	Gas	2	30	2150	30960	55980	19.0	39.2
13-B	Gas	2	0	2165	29600	45820	17.0	14.6
1-B	Gas	2	30	2180	Broke in driving			
2-B	Gas	2	30	2184	Broke in driving			
8-B	Gas	2	30	2190	Broke in driving			
10-B	Gas	2	35	2193	Broke in driving			
12-B	Gas	2	20	2200	Broke in driving			
22	Oil	1	20	2211	Broke in driving			
7-B	Gas	2	30	2211	Broke in driving			
11-B	Gas	3	10	2230	Broke in driving			
23	Oil	1	20	2232	Broke in driving			
6-B	Gas	2	30	2247	Broke in driving			
4-B	Gas	3	30	2250	Broke in driving			
21	Oil	3	0	2252	Broke in driving			
5-B	Gas	3	0	2265	Broke in driving			
42	Oil	2	0	2283	Broke in driving			
1	Oil	2	0	2350	Broke in driving			

*Estimated.

A certain percentage of rivets of both grades, heated by any method to temperatures approximately 2000 degrees Fahr. or over, either broke in driving or failed to withstand a cold bend test 180 degrees flat after driving.

No rivet of either grade, heated to a temperature under approximately 2000 degrees Fahr. failed in driving and invariably stood a cold bend test of 180 degrees flat after driving. By alternating one grade of steel with another, one rivet at a time in the oil furnace, so that heating conditions were duplicated as nearly as possible, it was observed that the cut thread bolt stock stood a higher temperature without failing in driving or subsequent bending, than the A.S.M.E. boiler grade, as shown in the following tabulation:

Number of rivets	High sulphur cut thread bolt "D"	A.S.M.E. boiler "B"
Driven	22	18
Broke in driving	2	14
Broke in bending	10	2
Driven and bent satisfactorily	10	2

Similar results also were obtained using the gas forge and electric heater. In all cases where rivets broke in driving, their temperature was sufficiently high to show above visible color when removed from the die. Rivets which were broken in driving in the device are shown in Fig. 1. The fractures are identical in character and appearance with those illustrating complaints as represented by sample *F*.

After having obtained these results it was decided to extend the investigation to cover different grades of steel and to measure the driving temperatures of the rivets with an optical pyrometer. Consequently the following grades of steel were made up into ¾x5-inch rivets.

Grade of steel	Ladle Analysis, per cent Carbon	Manganese	Phosphorus	Sulphur
A.S.M.E. boiler	.10	.33	.011	.035
A.S.M.E. boiler	.11	.48	.014	.033
High manganese	.11	.60	.019	.034
Lloyds	.22	.46	.014	.045
High sulphur cut thread bolt	.20	.84	.017	.100

The high manganese steel was selected for experiment and had a manganese content exceeding the A.S.M.E. limit of 0.50 per cent. The results of the driving tests for steels "A," "B," "C" and "D" are shown in the accompanying tables, each table covering one grade of steel. At the head of each table is shown the physical properties of the steel as rolled and of rivets heated to 2300 degrees Fahr. in three minutes and not driven. Then follows a series of tests of rivets after they were driven in the testing device. Each table shows the method of heating, time in the furnace, driving temperature and disposition of each sample. Certain rivets which successfully withstood driving were used for tensile tests, all such tests being made on standard ½-inch turned specimens. Other rivets were used for shearing tests, bend tests and microscopic investigation.

From these tests it was found that heating the rivets to 2300 degrees Fahr. for three minutes and cooling in the air did not materially affect the physical properties, although a large increase in grain size occurred.

Lloyds Rivet Grade "C"

Ladle Analysis:	Car. .22	Mang. .46	Phos. .014	Sul. .045	Elastic Limit Lbs. per Sq. Inch	Tensile Strength Lbs. per Sq. Inch	Elongation in 2" %	Reduction of Area %
As Rolled	Average 6 Tests				41330	63350	35.6	59.1
Heated to 2300° F in 3 Minutes in gas furnace and cooled in air	Average 4 Tests				36490	64100	35.1	58.6

Serial No.	Type of Furnace	Time in Furnace Min.	Sec.	Temperature of Rivet Deg. F				
5	Gas	1	30	1987	45400	67230	31.0	65.4
10	Gas	2	30	1987	46790	68300	30.0	64.7
29	Oil	1	45	2058	47610	67290	32.5	68.2
13	Gas	3	0	2095	48490	69280	30.0	55.6
14	Gas	2	0	2111	44060	69280	33.5	66.4
4-C	Gas	1	55	2115	Shearing strength 50000 lbs. per sq. inch			
11	Gas	3	0	2130	50020	69380	24.0	42.2
19	Oil	1	45	2138	45360	68300	28.0	49.1
3-C	Gas	1	45	2150	Shearing strength 52000 lbs. per sq. inch			
20	Oil	1	30	2175	Broke in driving			
15	Gas	3	0	2184	43990	69100	17.5	30.0
5-C	Gas	2	10	2193	31200	51320	5.0	20.6
18	Oil	1	30	2193	Broke in driving			
2-C	Gas	2	0	2202	Broke in driving			
6-C	Gas	2	15	2202	Broke in driving			
7-C	Gas	2	0	2247	Broke in driving			
17	Gas	3	30	2256	Broke in driving			
1-C	Gas	2	30	2265	Broke in driving			
10-C	Gas	2	0	2283	Broke in driving			

High Sulphur Cut Thread Bolt Steel "D"

Ladle Analysis:	Car. .20	Mang. .84	Phos. .017	Sul. .100	Elastic Limit Lbs. per Sq. Inch	Tensile Strength Lbs. per Sq. Inch	Elongation in 2" %	Reduction of Area %
As Rolled	Average 6 Tests				41360	63810	35.2	62.0
Heated to 2300° F in 3 Minutes in gas furnace and cooled in air	Average 5 Tests				38080	64490	34.8	61.4

Serial No.	Type of Furnace	Time in Furnace Min.	Sec.	Temperature of Rivet Deg. F				
D-13	Gas	1	30	1810	45260	70030	35.0	64.1
D-12	Gas	1	40	1840	46190	70270	30.0	60.5
40	Oil	3	30	1866	48600	70940	27.5	55.6
D- 6	Gas	1	30	2009	46440	69400	25.0	57.3
31	Oil	1	30	2020	47880	70800	32.5	66 4
D- 3	Gas	1	45	2064	50700	69730	32.0	58.3
D- 8	Gas	1	50	2064	45200	68300	30.0	60.5
32	Oil	1	40	2075	47280	74120	16.5	27 5
D- 1	Gas	2	0	2085	46450	70850	30.0	60.4
D- 7	Gas	1	40	2095	45930	69400	35.0	65 7
D- 5	Gas	1	45	2095	51330	69300	30.0	58.8
33	Oil	1	55	2110	Broke in driving			
3	Electric	1	30	2100*	37000	49940	5.0	6.3
4	Electric	1	30	2100*	41570	67580	13.0	21.0
4-D	Gas	2	10	2238	39310	45200	3.0	2.4
2-D	Gas	2	0	2247	37000	64700	10.0	14.5
1-D	Gas	1	45	2256	41600	69350	26.0	52.3
3-D	Gas	2	0	2256	Shearing strength 49800 lbs. per sq. inch			
6-D	Gas	2	30	2283	37880	43250	4.0	4.5
5-D	Gas	2	15	2310	38180	63100	21.0	18.7
7-D	Gas	2	30	2342	42930	69900	18.0	37.5
11-D	Gas	2	45	2420	Broke in driving			
10-D	Gas	2	30	2450	Broke in driving			
8-D	Gas	2	40	2444	Internal rupture			

*Estimated

Ten rivets of the same size used in these tests of the A.SM.E. grade were heated to temperatures of 2256 to 2340 degrees Fahr. and driven in a die composed of two solid half sections. The results of tensile tests prepared from these rivets showed the physical properties were not materially affected.

It was found that for each grade of steel there was a critical driving temperature below which there was a slight increase in elastic limit and tensile strength, with ductility comparing favorably with that of the steel as rolled. When the critical temperature was exceeded, there was a decided falling off in the ductility, both the elongation and reduction of area decreasing with the increase in temperature. As the temperature was increased further, the result was intergranular rupture identical with ruptures produced in rivets driven at high temperatures in the device.

The critical temperatures of driving were consistently lower when oil was used for heating than when gas was used. The breakage in driving occurred at a lower temperature with the oil heated rivets. The gas heated rivets, although showing loss of ductility, did not actually break in driving until higher temperatures were used. This may be accounted for by the oxidizing or "cutting" flame produced by the high air pressure of the oil burner.

Critical temperatures of driving for different grades were approximately as follows:

Serial	Grade	Temperature, degrees Fahr.
"B"	A.S.M.E. boiler	1975
"A"	A.S.M.E. boiler	2060
"E"	High manganese	2125
"C"	Lloyds	2110
"D"	High sulphur cut thread bolt	2065

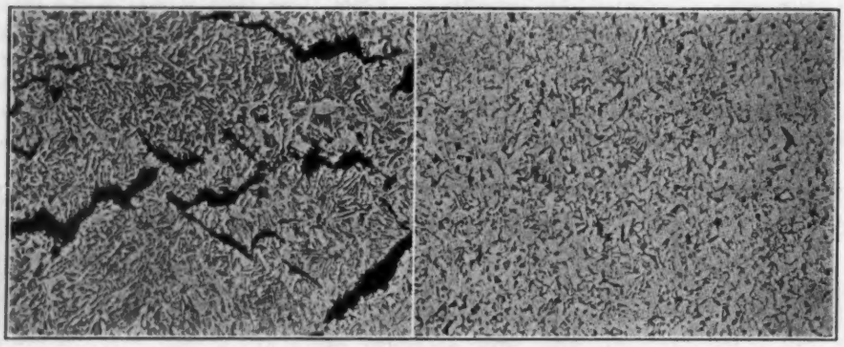


FIG. 2 (LEFT)—MICROSTRUCTURE OF A. S. M. E. BOILER STEEL "A" WHICH WAS HEATED PROPERLY TO 1917 DEGREES FAHR. FIG. 3 (RIGHT)—MICROSTRUCTURE OF HIGH SULPHUR CUT THREAD BOLT STEEL "D" HEATED TO 2444 DEGREES FAHR. FAILURE HAS OCCURRED

breaking of the rivet in every case. Microscopic examination of two rivets broken in driving at two shops and representative of complaints, revealed

From this investigation the following conclusions are drawn:

1. High temperatures combined with alternate compression and tension, generally termed "vibration," are the cause of rivets breaking in hammer driving.

2. High temperatures combined with alternate compression and tension, if not resulting in breaking in driving, destroy the physical properties to such an extent as to render rivets unfit for service.

3. Heating rivets to over 1950 degrees Fahr. produces a structure which will not withstand rapid alternate compression and tension. These opposing stresses produce strains which result in intergranular weakness and rupture. Such a structure is shown in Fig. 8.

4. A rivet heated to 1950 de- Fahr. as a maximum limit and a sufficient time allowed for soaking will drive just as easily and fill the hole equally as well as a rivet heated to a much higher temperature. The structure of a rivet properly heated is shown in Fig. 2.

5. A rivet which "runs," emits sparks or "spit" should never be driven.

6. For each grade or composition of rivet steel there is a critical temperature for driving which must not be exceeded, or the result will be breakage, intergranular weakness and interior rupture.

7. The critical temperature increases consistently with the manganese content within the range covered by this investigation, as shown by results with steels "B," "A" and "E," containing respectively 0.33, 0.48 and 0.60 per cent of manganese.

8. High sulphur, accompanied by high manganese, is not a cause of rivets breaking in driving. The critical driving temperature of grade "D" rivets with 0.10 per cent sulphur and 0.84 per cent manganese was higher than those of the A.S.M.E. boiler grades "B" and "A" containing 0.035 and 0.033 per cent sulphur, respectively.

Discuss Blast Furnace Refractories

ENDEAVORING to determine a formula which will aid in estimating the length of life of the firebrick lining of the average blast furnace, members of the Southern Ohio Pig Iron & Coke association meeting Nov. 18 at Ashland, Ky., finally confessed themselves defeated. President R. H. Sweetser had put up to the membership the question of the life of a stack in order to reply to the questionaire proposed by the American Iron & Steel institute, which plans a revision of statistics covering the theoretical annual production of pig iron by the country's blast furnaces.

After the afternoon had been devoted to a discussion of refractories in blast furnaces and coke ovens, the consensus of belief was that such a formula is impossible to make. Too many variable factors enter into the problem as causes affecting the failure of a stack lining to permit any one being assigned as the most likely. Brick alone are not the sole cause, probably not even those brick which show disintegration under the stress of a campaign.

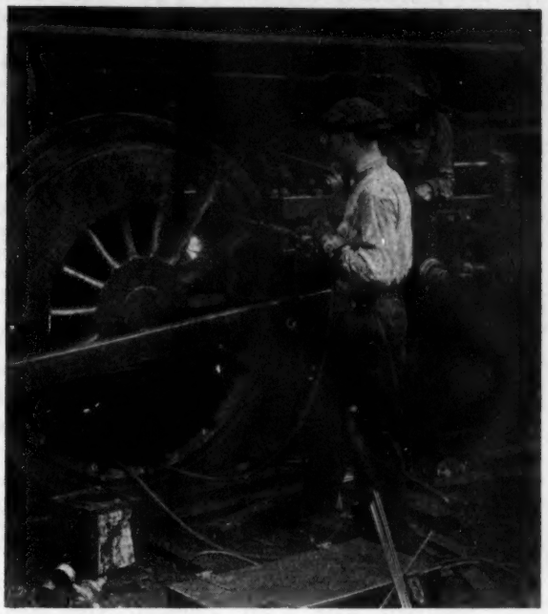
The principal paper of the afternoon session, which was held in the offices of the American Rolling Mill Co. at the Ashland works, was read by Prof. M. C. Booze, Mellon institute, Pittsburgh, on "Refractories for Blast Furnace and Coke Oven Use." Participating in the discussion of this paper were Professor Booze, President Sweetser, Charles J. Peebles, Charles Rice, G. G. Coolidge, assistant sales manager for the Harbison-Walker Refractories Co., Pittsburgh; while others included Dr. W. R. Jillson, state geologist of Frankfort, Kentucky, and Prof. Charles H. Behre, geologist of the University of Cincinnati.

Causes for the disintegration of blast furnace linings were stated by various speakers and skepticism was expressed that carbon deposition caused it to the extent claimed, although this might lead to distortion and lifting even of the top of the stack. Impregnation of the brick by zinc or lead fumes penetrating into the middle courses through the use of "blue-billy" in the burden, might be one cause. But experienced brickmakers declared even if disintegration had taken place partially, they doubted

(*Concluded on Page* 1346)

Steel Industry Uses Acetylene Gas to Advantage

In Cutting and Welding the Oxyacetylene Method Is Regarded Highly—As a Manufacturing Operation or a Repair, It Affords Economy



WITHOUT the oxyacetylene process the modern steel foundry would labor under an almost insurmountable handicap, declared R. W. Thomas, steel foundry superintendent, Vulcan Iron Works, Wilkes-Barre, Pa., in addressing the twenty-sixth annual convention of the International Acetylene association at Chicago, Nov. 18-20. In his paper, "Influence of Oxyacetylene Cutting on Steel Foundry Practice" he said:

"The present day steel casting manufacturers cannot afford to take any chances on losing even one casting. He does not spare a penny to obtain the best of raw materials to be used in his sand mixtures and metal mixtures. He does not spare a cent to equip his plant with the most up-to-date appliances to produce molds, cores, etc., that are more perfect.

"In fact, he finds it imperative to put his best of everything in his castings. So why should he take any chances in losing a casting on account of its not being solid throughout, due to improper heading and gating? And as a matter of fact, the properly conducted steel foundry does not take the chance. Why? Because it is a known fact that a lump of excess metal known as a riser or head properly placed above the heaviest section or sections of a steel casting will act as a reservoir to feed more molten metal into any cavities that may occur.

"It is further known that with the aid of oxy-acetylene these risers can be removed no matter where they are placed on steel castings. There was a time when only the circular saw was available, when foundrymen in making large castings could place them only on outside, high, protruding surfaces; and consequently many a steel casting was lost or at least used when it should not have been used, on account of not having been fed properly. These rejects were caused by the castings being hollow in places. In this respect, steel is a great deal different from gray iron. This may be attributed to the fact that steel has approximately twice the shrinkage in cooling as has iron; and also it must be remembered that a good steel for castings must be absolutely killed, that is, have practically all its oxides and gases taken from it before it is tapped from the furnace. When this is accomplished, the steel in the mold has a tendency to shrink away and leave cavities in the larger sections of metal.

"Any steel foundryman and casting designer of experience should be able to bring to your attention hundreds of cases where absolute surety of removing risers, no matter where and how they are placed on a steel casting, makes his business of manufacturing or designing a great deal more flexible. There is really no excuse now-a-days for a steel foundryman to insufficiently head his castings. It is true, nevertheless, that engineers should endeavor as much as possible to design steel castings so that only plain riser cuts will be necessary and that the risers be so placed that castings can be properly made. You can see readily that the steel casting manufacturer has so much need for oxygen and acetylene and the apparatus that any break-down or hold-up in the work in this phase of his business is felt keenly. Some of the most embarrassing positions are escaped by steel foundrymen if they make every possible use of the oxyacetylene cutting that it offers him.

"Another place where steel foundrymen are today making a great deal of use of the acetylene cutting torch is in flask fitting. There are a number of steel foundries that equip their flask fitters with an acetylene cutting outfit. One of the group is sufficiently trained in cutting to handle all necessary cuts contingent to flask building, fitting and repairing. Those who are acquainted in any way with the nature of castings that are made in a jobbing steel foundry will recall that there is a great variety in the size and shape of castings that are made from time to time. It is for this reason that special flasks for certain

Acetylene Blowpipe Has Important Uses

ACETYLENE—beacon of progress. Not only figuratively but literally. Dissolved acetylene was the first reliable automobile light, it made night driving possible, stimulated the good roads movement, and is without question the biggest single factor responsible for our present network of automobile highways and the traffic which overloads them. Acetylene beacons light the seas, guiding ships past dangerous shoals, safe into port. Acetylene beacons light our highways. Acetylene beacons will light the airways of the future.

Thus all modern transport depends on acetylene—on land, on water and in the air. But its influence does not stop with merely lighting the ways. It keeps the traffic moving. Beyond question or doubt, the acetylene welding blowpipe is the most important development in metal manufacturing in the last decade. Its future influence will be enormous. Its utility has only dimly been appreciated, and even yet it has been described as the one agency which has enabled the American railways to exist through the recent years of low rates and high costs, by keeping the rolling stock and track in first class shape without ruinous expenditures for new cars and rails.—E. E. THUM, *Union Carbide Co., New York.*

jobs are practically unknown in a job shop.

"On the other hand, a flask must be fitted to suit almost each pattern as it is received. It is true that flask alterations do not have to be made for every pattern as it is put into the sand, but in the majority of cases alterations of some degree are necessary. It often happens that the steel cope bars must either be cast special for the one or two castings to be made, whereas bars already on hand could be used by possibly making a slight change by cutting the bar where necessary. This saves the expense and time lost in making up new castings for flask parts. We have made beneficial use of the acetylene cutting torch to remove scrap from flasks."

Accept Welding As Reliable

All of the newest designs of airplanes for the United States army, from the smallest 2000-pound racer to the 12,000-ton bomber, have welded steel fuselages, said T. B. Johnson, chief of the materials section, engineering division, army air service, Dayton, O. Following exhaustive tests the properly-made oxyacetylene weld has been accepted as reliable for this exacting type of service.

For fuselage construction, according to Mr. Johnson, two types of steel tubing are used: 1. Carbon content, 0.20 to 0.30 per cent, tensile strength not less than 55,000 pounds per square inch, yield point 36,000 pounds per square inch; 2, a chrome-molybdenum steel, with minimum tensile strength of 95,000 pounds per square inch a yield point of 60,000 pounds per square inch and the following chemical analysis:

	Per cent
Carbon	0.25 to 0.35
Manganese	0.40 to 0.60
Chromium	0.80 to 1.10
Molybdenum	0.15 to 0.25

The chrome-molybdenum steel is used where high stresses are encountered, since welding causes practically no reduction in the strength of this alloy. In welding both types of tubing, a low carbon welding rod containing carbon 0.08 per cent; manganese 0.15 to 0.35 per cent; sulphur, 0.04 per cent maximum; phosphorus, 0.04 per cent maximum, has been found most satisfactory. A study of failures which had occurred in welded fuselages showed that in every case improper welding or poor design was responsible, said Mr. Johnson.

A. R. Lytle, research department, Union Carbide & Carbon Co., Long Island City, N. Y., presented the following conclusions in his paper, "Effect of Heat of Bronze Welding on Cast Iron Pipe":

1. Neither cast iron welding nor bronze welding has any detrimental effect on the structure of cast pipe.

2. It is possible that with cast iron high in phosphorus, the bronze welding may weaken the structure sufficiently to lead to failure, though this is doubtful.

3. Inasmuch as both welding with cast iron or with bronze strengthen the base metal at that point, it is more or less natural that line failures in over-stressed pipe should occur just outside these altered zones.

4. It may well be that some of the failures occuring in welded gas lines have been the result of surface cracks or defects in the pipe. The influence of these cracks may be emphasized by the welding process.

The scrapping of five warships at the Philadelphia navy yard was described by Cammander H. E. Roselle, construction corps, United States navy. An expenditure of $5000 for oxygen and acetylene pipe lines proved to be a real economy, he maintained. Gas pressures were controlled carefully, as operators tended to use more pressure than necessary. Trouble was encountered in the heavy coats of paint and confined spaces and canister type respirators or air helmets were necessary to avoid lead poisoning. By systematic procedure in cutting, according to Commander Roselle, the navy was able to realize $500,000 more than had been bid for the five ships.

Advocates Procedure Control

Realizing that the highest efficiency can result only when the welding operations are intelligently controlled, L. E. Ogden, vice president, Oxweld Acetylene Co., New York, laid down a set of fundamental principles which he called "procedure control of welding". The specifications of procedure control he grouped as follows: A check on welders, selection and inspection of material, design and layout of the welded joint, preparation of the piece for welding, welding technique including organization and inspection of welding and test of completed joint.

W. A. Slack, Torchweld Equipment Co., Chicago, urged that drops for individual outlets be ample, calling it good practice to use drops ½-inch or larger as a minimum. All lines should have drains as a precaution against freezing of trapped water. Pipes for oxygen lines should be freed from all traces of grease and oil by first heating strongly and then washing with caustic soda solution, he recommended.

Arranges Conference On Welding Practice

A conference for welders to be held Dec. 3 and 4 is being arranged by the engineering extension department of Purdue university, Lafayette, Ind., and will be the first conference of this nature to be scheduled under these auspices. The principal part of the program will consist of lectures, lantern slides, motion pictures and inspection trips. All methods of welding will be discussed. Lectures and demonstrations on electric, thermit, oxyacetylene and special types of apparatus will be given by representatives of companies manufacturing this equipment. In addition, special demonstrations will be arranged for persons particularly interested in any special branch of work.

Discuss Refractories

(*Concluded from Page* 1344)

whether it would have become known except the furnace were shoveled out.

The dinner session was held at the Bellefonte country club, the presiding officer being Donald N. Putnam, former secretary of the association. W. C. Culkins, secretary, Ohio Valley Improvement association, Cincinnati, described the work of the association for 30 years in pushing forward the development of the Ohio river as a highway of commerce and industry. Up to this time 41 dams have been built by the federal government, providing a 9-foot stage of water from Pittsburgh to Cincinnati. Nine dams still are to be completed but they are under way. He urged the completion of these dams by 1929 through congressional appropriations.

Standing committees named included the following:

COAL EVALUATION—Prof. D. J. Demorest, of Ohio State university, chairman; G. M. Coughlin, Thomas Devenny, E. G. Bailey, L. R. Forrest, E. A. Hitchcock, J. H. Briscoe and John Teegarden.

FURNACE RATING—Charles R. Peebles, chairman; J. S. Ferguson, Karl Steinbacher and H. A. Berg.

MEMBERSHIP — Earl Brokenshire, chairman, and Robert Tynes.

SAMPLING AND ANALYSIS—W. P. Daines, chairman; H. K. Bourne and Prof. H. E. Nold, of Ohio State university.

TRAFFIC—S. S. Bridges, chairman; J. L. Roney, J. W. Patton and A. E. Singleton.

It is planned to hold a joint session of the association with the Ohio chapter of the American Mining & Metallurgical institute at Ashland, Ky., on Jan. 20 when it is hoped the new secretary, H. Foster Bain and others will be present.

Roland Steel Co., New York, has increased its capitalization from 1000 to 10,000 shares of $100 each and from 3000 to 45,000 shares no par value.

Editorials

Attacking Local Taxes

ANOTHER annual meeting of the National Founders association has passed into history, and once again it has made an important contribution to constructive business enterprise. In this case, however, credit may not be laid to the efforts of the association alone, but rather along with them, to the spirit of mutual helpfulness and clear thinking of powerful farm organizations and transportation and business groups. To realize the existence of an evil is one thing, but to set a well planned operating machinery to combat the evil is another thing, and that is precisely what the recent meeting in New York contributed.

As now a matter of record, waste and extravagance in governmental expenditures was the object of attack at this convention. Substantial reduction in federal expenditures in recent years have been more than offset by the rapid increase in state and local appropriations. In fact, taxes today are almost as high as when the country was carrying the peak of its war burden. It was most emphatically stressed that no urgency exists for the continuance of this burden, which so heavily exacts its toll in individual initiative, public enterprise and national prosperity.

With the fight to be chiefly of state and local character, many problems present themselves. It will take patience, the utmost thought and cooperation of all to win; and of equal importance, strong leadership. The convention, it may be truly said, has contributed this leadership. Further, it has placed the campaign effectively under way, and that is half of any battle.

Steel, Friend of the People

STEEL has made a good many multi-millionaires, of whom the public has heard much, but it has also benefited its vast army of workmen to an extent not generally known or appreciated.

In the past 15 years the average weekly wage of steel workers has risen from $11.69 to $25.73. Between 1910 and 1924 the average weekly hours of steel mill labor decreased from 74.5 to 59. At the same time the average earnings per hour advanced from 15.7c to 43.4c. Meanwhile the price of steel to the public was rising only from 1.6c to 2c per pound—proportionately much less than the labor cost.

In the days before the United States was plunged into the Great War it was the steel industry that voluntarily stepped up its wage rates and passed its prosperity along to the rank and file. Likewise in 1922 common labor in the mills was advanced and wage rates were put into line with the cost of living.

There is a reason, of course, why organized labor has never made any appreciable progress in organizing the workers of the iron and steel industry. For one thing, as a Chicago editorial writer has put it, steel has proved to be the friend of the plain people.

Yes, Capitalism Is Growing

THE spread of the movement toward making all workers "capitalists" to promote their interest in properity, even though it be on a small scale, is emphasized by the great increase in the number of so-called labor banks. It has been determined that there are in operation or preparing to operate by the end of this year no less than 75 of such banks. The first bank of this kind was established in 1920 in Washington, and the average rate of increase is 15 annually.

That the capitalists among the wage earners are not confined to any class is evident from the figures pertaining to stock ownership by employes in the large industrial corporations. The diffusion of ownership is indicated in corporate fact that the number of stockholders in corporate enterprises has increased from 4,000,000 in 1900 to more than 15,000,000.

The opportunity for saving and investment is shown by the fact that a 10 per cent increase in wages for employes of the Bethlehem Steel Corp., for instance, would add approximately $10,000,000 to their income. That much of the savings acquired through wage increases in recent years has been used for the purchase of stock is apparent when one considers that in the Bethlehem corporation there are 49,000 stockholders, with 14,000 employes subscribing for more shares.

In other ways the prosperity of American workers is shown by the test of "ownership". Savings deposits in the United States increased from $8,700,000,000 in 1914 to $20,800,000,000 in 1924. The number of depositors increased from 11,000,000 to 38,000,000 and per capita deposits from $89 to $186.

The movement is in the right direction. The agitators who are most to be feared are those who

having nothing, have nothing to lose through socialism or bolshevism, but see in such upheavals their only hope of gain.

What Is Our Real Capacity?

IN THE recent distribution of questionnaires concerning pig iron, steel ingot and steel casting capacity, the American Iron and Steel institute has inaugurated an investigation of tremendous importance to the American iron and steel industry. A revision of capacity figures is long overdue, present figures being overstated and incapable of attainment.

For example, coke pig iron producing capacity of the United States at the end of 1924 was reported as 52,896,495 gross tons, while in 1923, the year of greatest production, the output was only 40,109,969 tons, or 75.53 per cent of the capacity. In the case of steel ingots, capacity reported officially at the close of 1924, exclusive of crucible ingots, was 58,280,790 gross tons. The greatest production was in 1917 with 43,496,318 tons, or 86.52 per cent of capacity, and the second largest in 1923 with 43,443,538 tons, or 76.78 per cent of stated capacity. Likewise, steel casting capacity reported to the institute at the close of 1924 was 2,698,385 gross tons. The largest production of 1,458,031 tons was made in 1923 and represented 54.03 per cent of capacity.

Considerable business value as well as economic interest is attached to the production rates of iron and steelmaking but for these figures to serve as reliable indexes, it is important that the pig iron and steelmaking capacities be accurate. The questionnaires of the American Iron and Steel institute have been prepared painstakingly and merit the close attention of the iron and steel industry. In order that reliable capacity figures may be compiled and announced at the earliest possible moment, IRON TRADE REVIEW urges the full co-operation of producers with the effort of the institute.

President Points Way for Business

IN A plain business talk to business men, President Coolidge in his address of last week before the chamber of commerce of the state of New York set forth with a clarity seldom approached in a similar discussion, what true business should have in view. The President's address was a summing up of a favorable balance sheet, with the inclusion of some wholesome discussion as to what should lie ahead.

True business, the President declared, represents the mutual organized effort of society to minister to civilization, that effort resting squarely on the law of service. Relief was expressed by the speaker that the present generation of business has shown every disposition to correct its own abuses, with as little intervention of the government as possible. In other words, business and industry generally are regulating themselves satisfactorily. Mr. Coolidge made it clear, however, that supervision by the government, originally imposed because of the attempts on the part of business to gain special privilege, would have to be continued, lest in the future a revival of the old days of privilege would take place. It always has been a problem in a republic, the President aptly pointed out, to maintain on the one side that efficiency which comes only from trained and skilful management without running into fossilization and autocracy, and to maintain on the other that equality of opportunity, which is the result of political and economic liberty, without running into dissolution and anarchy.

Views of the public generally toward industry and business have shifted significantly for the better in the last several years. Today business is in a more favorable position than ever to regulate its own household. It is ready to demand its right of fair consideration. This should apply to the production of both industry and agriculture, the distribution of transportation and commerce, and the service of finance.

What Our Readers Are Thinking

Sell Service, Not Steel

A SALES idea based exclusively upon an exchange of so many tons of structural steel for so much money is founded upon a wrong philosophy. If we are to encourage our selling effort on the sale of steel at so much per ton then we cannot expect much in the way of profits. Salesmanship becomes unnecessary when the whole story can be written on the price-tag.

The application of aggressive and intelligent salesmanship is but a demonstration to serve. Contracts sold by salesmanship represent the tactful selling of service. Without the ability to serve, there would be nothing to sell but steel at a price. To obtain business on your terms and at your prices calls for something more than the mere presentation of a bid.

The industry should emphasize the intangible features such as good will, superior workmanship, ability to deliver, favorable location, experience and reputation, and forget for the time being the factor of price.

Salesmanship in the structural steel industry begins at the time a bridge or a building is first proposed and never ceases until the buyer's name is on your contract to be accepted at your prices and on your terms.

Salesmanship is a highly developed science, and its influence is tremendous when properly understood and applied.—CHARLES F. ABBOTT, *in annual report of executive director, American Institute of Steel Construction, Nov.* 11, 1925.

The Reader's Page

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Basic Interests Working for State Tax Reductions

THE twenty-ninth annual convention of the National Founders association in New York last week was notable for the formulation of definite plans for promoting economy in public expenditures. The association showed special interest in taxes at its convention last year when a beginning was made in obtaining the co-operation of the granges in the movement for "better understanding between industry and agriculture."

Acetylene Association Discusses Gas Welding. Page 1345.

The meeting evidently was successful in establishing contacts necessary for united effort. This year transportation interests also were represented. Thus the annual meeting of the founders became a forum for industrial, agricultural and transportation interests, all in accord, and working especially for reduced state and local taxes. Much credit is due to those who started this movement.

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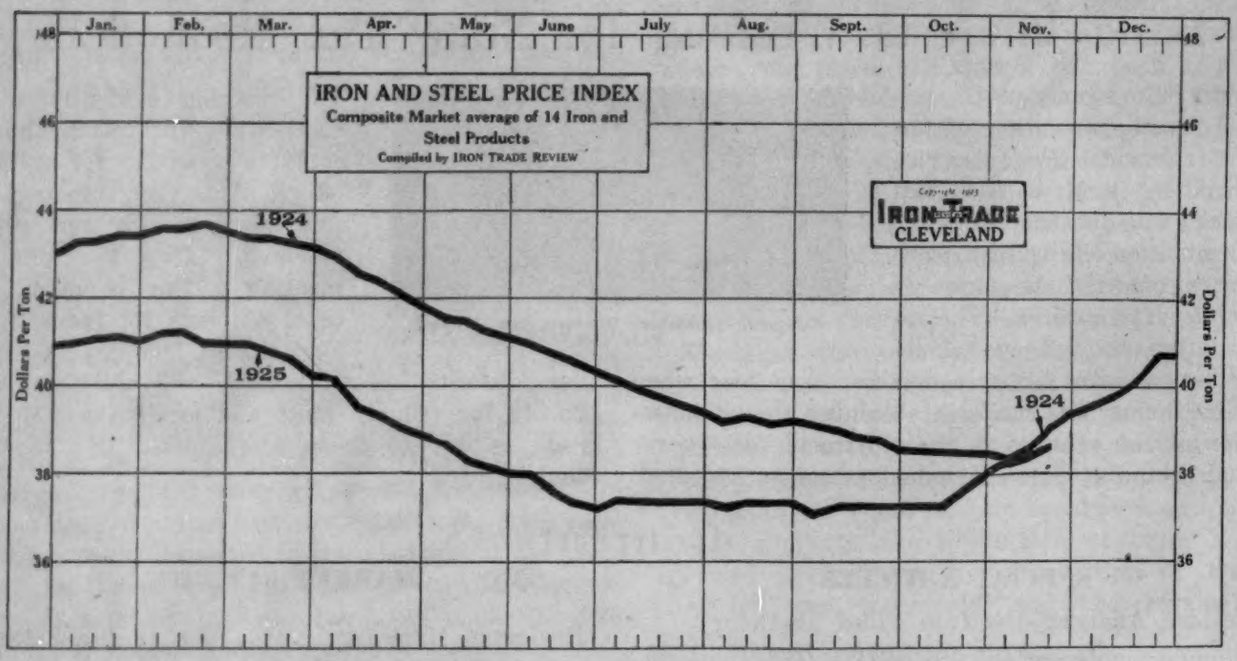
The Business Trend



Iron and Steel Prices Are Rising

By JOHN W. HILL, Financial Editor

NOTHING has happened in the iron and steel industry recently of more real significance than the upward movement of prices. This general and unmistakable strengthening of quotations has put the seal of confirmation upon improvement in the industry. Something more than a mere flurry of shortlived recovery is indicated.

DURING the summer, average prices scraped bottom. IRON TRADE REVIEW'S composite market average dropped to $37.21 a ton. That was the lowest point reached since the aftermath of the 1921 depression. The composite a few months ago was only 41 per cent above the 1913 level. This was far out of line with general wholesale commodities which stood around 60 per cent over 1913.

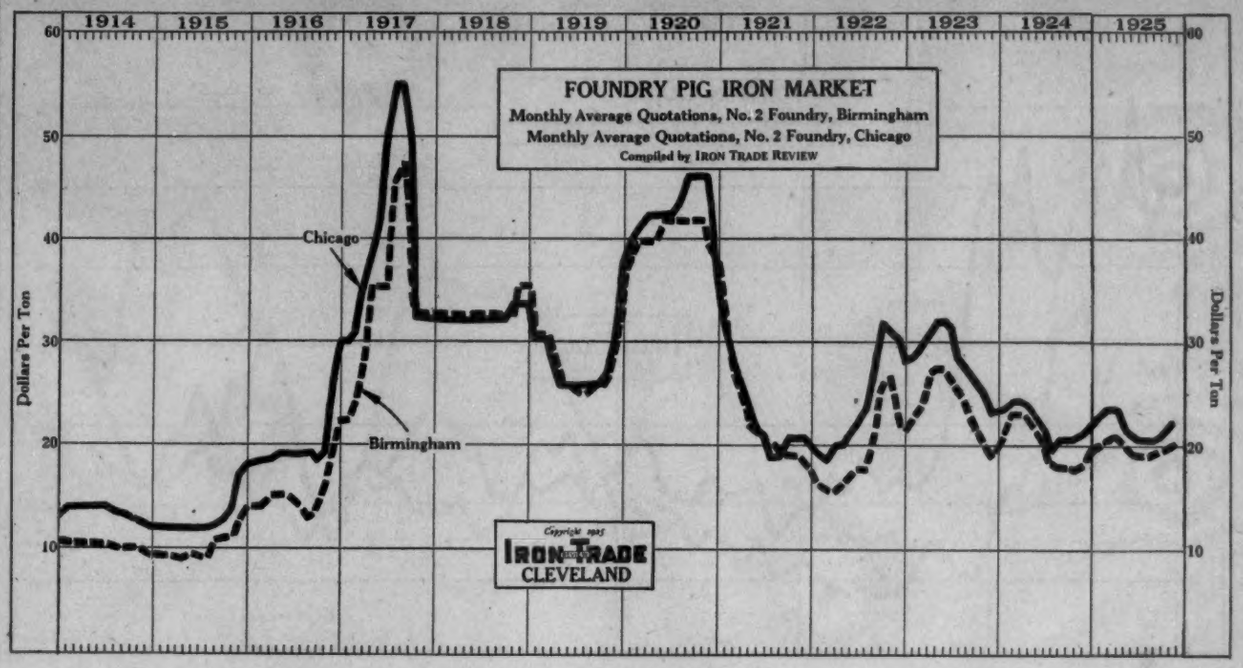
DURING August the tide turned in the iron and steel industry. Demand began to increase and outputs expanded. Prices failed to respond, however. That was in accordance with what usually happens after a slowing down spell in the industry. The first blush of recovery finds producers with much idle capacity and anxious to accumulate orders.

THE result is that for a time, price concessions continue. They continue until order books begin to fill out and business is flowing into mills in sufficient quantity to take up much of the slack of idle capacity. That is the significance of the current price situation.

DURING recent weeks the composite market average has had the sharpest advance of any time since the spring of 1923. It has advanced about 5 per cent and is now approximately 45 per cent above the 1913 average. It has almost reached its level of one year ago but it remains well below the general average of wholesale prices. A further leveling up seems probable.

NOT only iron and steel prices but general industrial prices are tending to advance. Fortunately, this is taking the form of a steady unspectacular movement. There have been few runaway markets in industry. The stock market which indulged in a series of sensational advances is now tasting the bitter remedy of correction of its excesses. Business as yet has not tempted such a fate.

The Business Trend

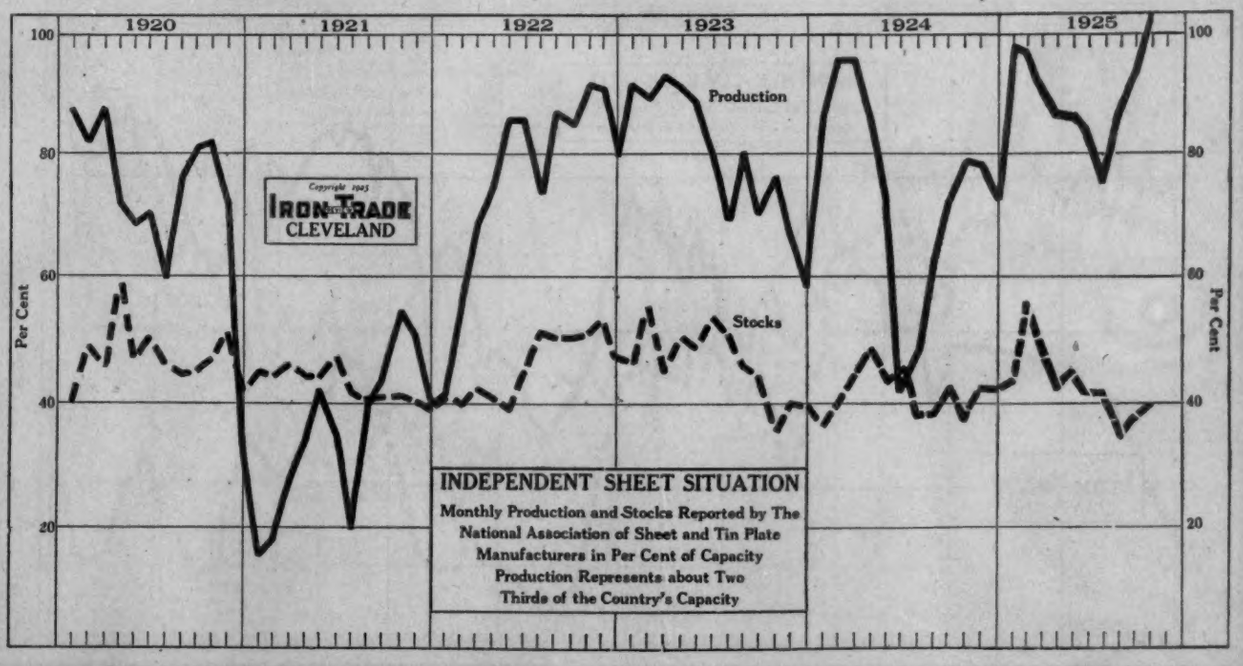


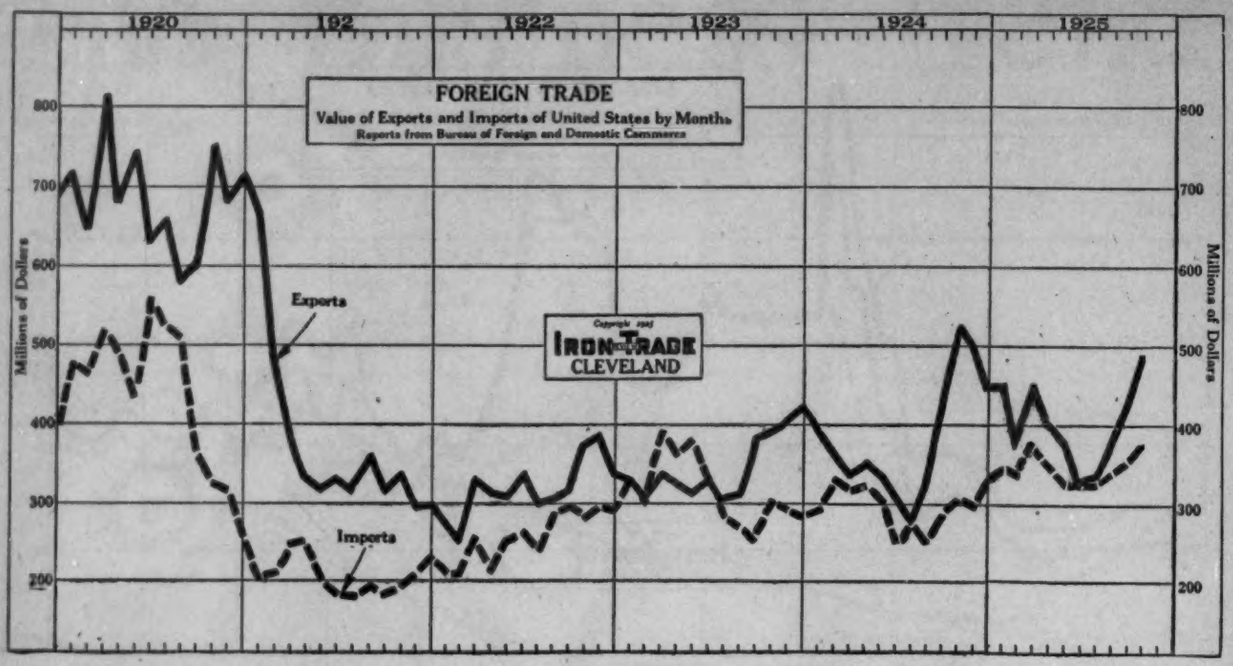
Foundry Iron

PIG iron markets have indulged in a convincing exhibition of strength. Increasing industrial activity has stimulated demand, while high coke prices, resulting from the hard coal strike, have lifted production costs of iron. Consequently higher prices have resulted. Chicago No. 2 foundry iron rose to $23 a ton in November. This compared with $21.60 in October and with $21.50 in September. Southern No. 2 iron also has gone higher, advancing to $21 a ton against $19.25 a ton in October.

Independent Sheets

ALL in all, sheet business in October was the best ever seen in any previous month since the record of the National Association of Sheet & Tin Plate Manufacturers was started. Sales of 403,491 tons represented 127 per cent of capacity and were exceeded by only one month before, November, 1924. Production of 348,714 tons, or 106.4 per cent of capacity was the largest ever attained. Shipments of 332,211 tons likewise were unparalleled. Unfilled orders gained also.



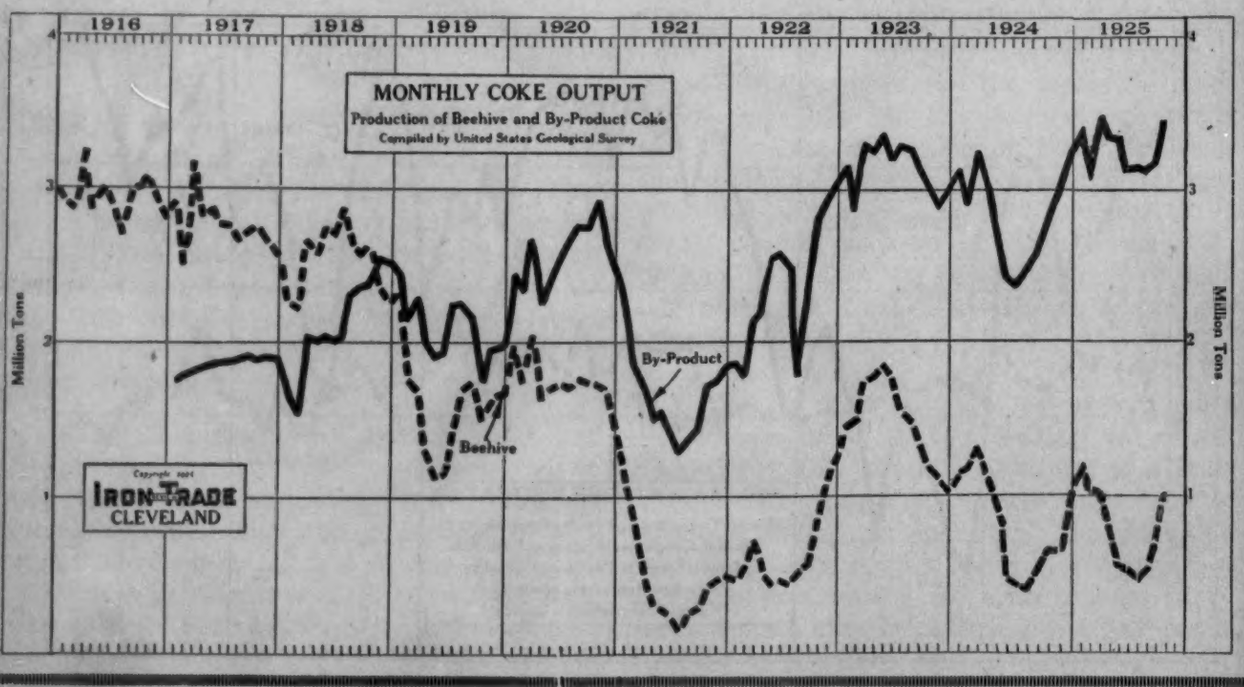


Foreign Trade

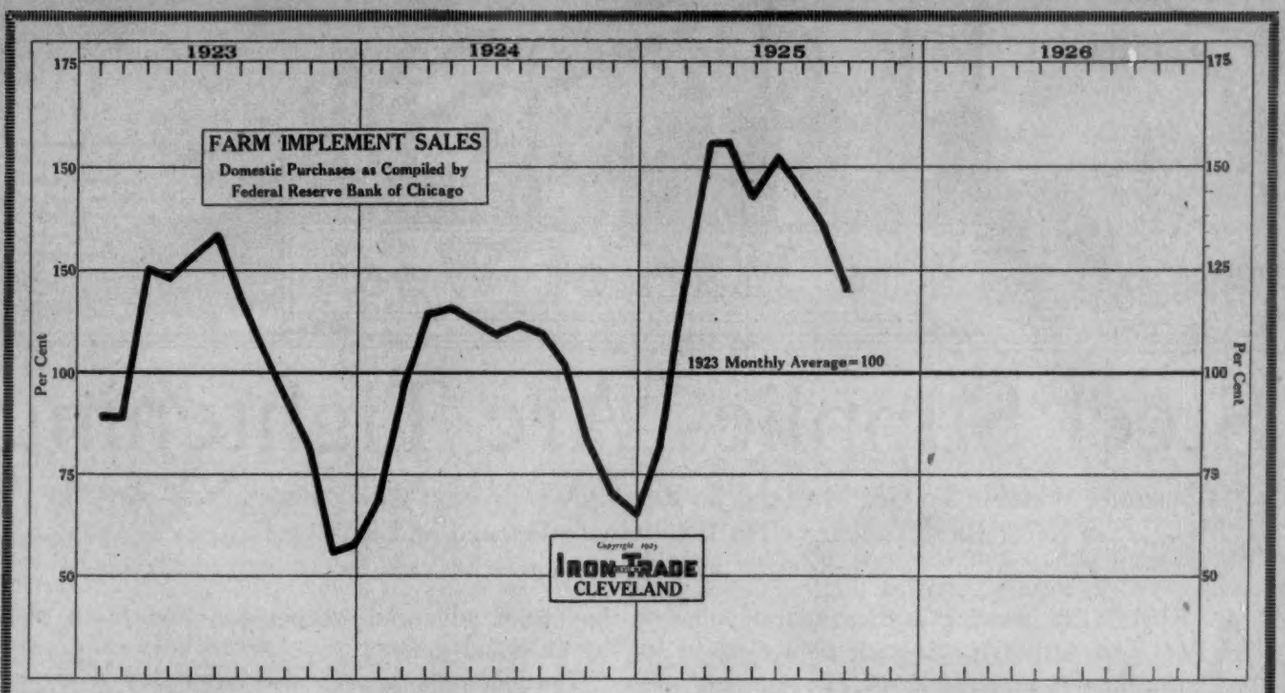
AMERICA'S foreign trade in October rose to huge totals. Exports were $493,000,000, the largest for any month of 1925, and with three exceptions the largest for any month since 1920. They were somewhat less than the $527,000,000 for October, 1924. Imports amounted to $375,000,000, a figure exceeded in only two months since 1920. The excess of exports over imports was $117,000,000 against $216,000,000 12 months before. Large imports reflect heavy purchases of raw materials by American producers.

Coke Output

COKE production has spurted into exceptional activity since the hard coal strike began. Furnace coke is being used as a substitute for anthracite. Meanwhile blast furnace activity has been increasing. Due to these stimulating factors beehive coke output jumped from 746,000 tons in September to 1,006,000 tons in October. By-product coke also has gained with an October total of 3,386,000 tons against 3,185,000 tons in September. Large output has checked the recently soaring prices of coke.



The Business Trend

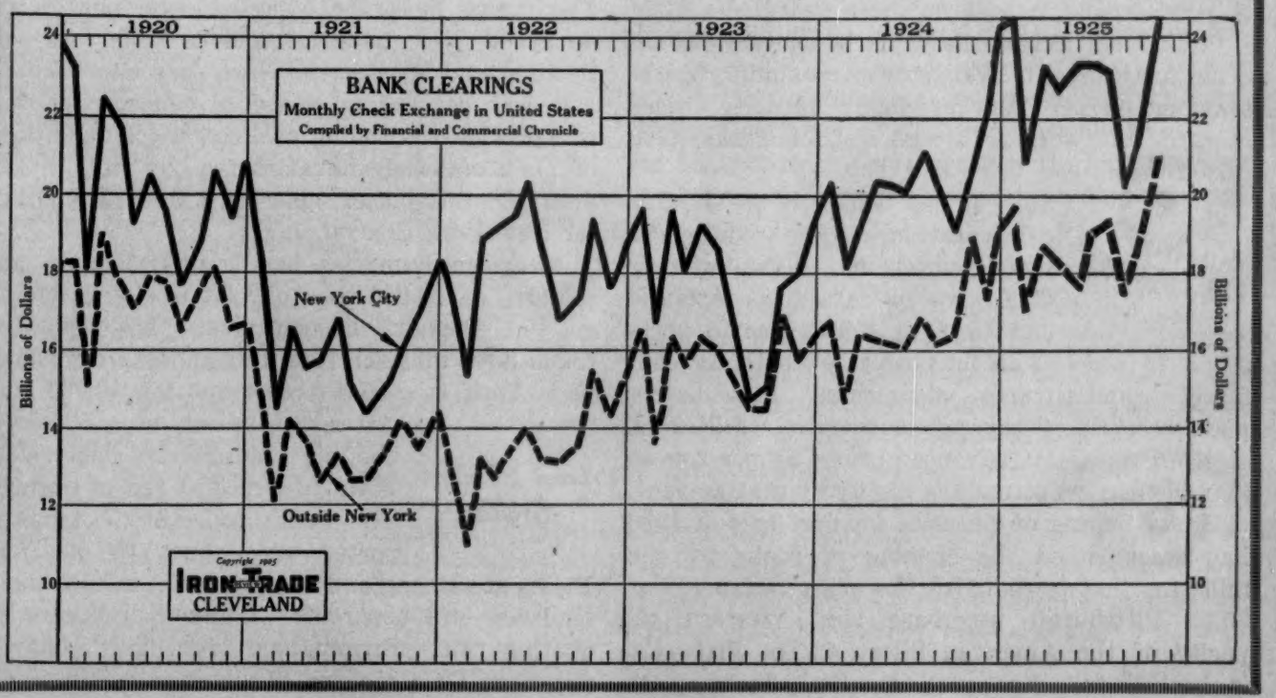


Farm Implements

SALES of farm implements this year have held at consistently high levels. Recently there has been some seasonal letting down in these sales but they are holding far above last year's volumes. According to the compilations of the Chicago federal reserve bank, sales in September declined 8.9 per cent from those for August. They were 41.2 per cent higher than they were in September 1924, however. Clearly the farmer is more able than in years to provide for his equipment needs.

Bank Clearings

BANK clearings October were without exception the greatest for any month recorded over a period of half a century. The total was $47,154,324,000, an increase of 16 per cent over the figure of one year before. Outside of New York, check exchanges reached $21,202,000,000, an increase of 11 per cent. The gain reflects improved trade, bigger production and distribution and greater payrolls. In New York the month's great Wall street activity is mirrored in an increase of 20 per cent in clearings.



Steel Supplies Are Tightening

Consumers Unable To Get Material So Readily—Deliveries Again Recede and Shortage of Sheet Bars Appears—Tin Plate Books Opened and Buying Is Heavy —Production Is Pushed Nearer Maximum

A FURTHER drawing in of available supplies of steel for early dispatch points again to the heavy magnitude of the current absorption of material by consumers. The pressure upon steelworks output has developed a shortage in some semifinished forms, especially sheet bars and higher prices readily have been commanded this week. In finished steel, deliveries have fallen back another step with the position of steel bars the most pronounced, and buyers are more urgent in following up their needs. Promises of shipments on lighter bar sections by leading mills run from four weeks to two months.

Buying is going along at a good gait especially in contracting for first quarter on which some advance usually is quoted. Various mills continue to take in new tonnage in excess of their shipments. The demand for cold-finished steel is proclaimed the best in three years.

Production, already large, is being crowded up a bit further. At Youngstown, maximum operations or 88 per cent of ingot capacity, were reached this week. Chicago district works have raised themselves to 86 per cent.

Coast Price Lowered

Steel prices delivered on the Pacific coast have been reduced $1 to $2 per ton due to the lowering of the water rate from Atlantic and Gulf to North Pacific ports $2 to $3 per ton on finished steel, both by conference and tramp steamships. Immediately upon receipt of this announcement, sellers of steel on the Coast advanced prices $1 per ton so that the market actually is higher by that amount.

Heavy buying of tin plate for first half of 1926 has accompanied the opening of books by the mills for that period with the price unchanged at $5.50 Pittsburgh per base box. Western capacity of the American Sheet & Tin Plate Co. is booked full for seven months. Terne plate has been advanced $2 per ton and black plate by an equal amount.

The leading producer also has followed the action of independent makers in raising sheets $2 per ton. Talk persists that an advance of $2 in wire is imminent but some mills have been booking business for first quarter at the former level.

Rail Orders Heavy

Western roads have their rail buying programs for 1926 about completed and with secondary orders to follow, it is believed the total tonnage placed will exceed 1925. In other directions, rail contracting is going ahead in a moderate way. A New England road is considering the purchase of 15,000 tons of foreign rails. Track accessory orders are heavy, those of the Southern Pacific being notable this week. Car orders have been few this week. The Santa Fe order expected soon now is put at 2850. New inquiries include 1000 for the Reading and 500 for the New York Central.

Recent car orders closed in Chicago territory will provide the rolling of 100,000 tons additional of plain material and axles for the mills in that district. Pittsburgh mills have taken 25,000 tons for New York Central cars.

American foundries have outbid French competitors on 17,000 tons of cast iron pipe for the city of Detroit. French shops, however, have taken 2000 tons for New England gas companies. New York is soon to come out for 10,000 tons.

Iron Market Steady

After its recent broad activity, the pig iron market has settled down to a modest run of business. The week's collective bookings reported were about 100,000 tons. Prices are strong and steady with some advancing tendency still apparent. Alabama producers are quoting $22 Birmingham for first quarter. Southern Ohio makers of silveries and bessemer

ferrosilicon have made another raise of $1 per ton in their schedule for this year with $1 additional for first quarter.

The coke market has eased off again with supplies large, weather more moderate and apprehension less over labor outbreaks in the Connellsville region. Spot furnace coke is selling at $4.50 to $5 ovens. Accordingly, consumers of metallurgical coke are less concerned over future needs and are backward in making contracts.

IRON TRADE REVIEW composite of fourteen leading iron and steel products edged up slightly again this week. This week's figure is $38.89 while last week it was $38.84.

Prices, Present and Past

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Nov. 25, 1925	Oct. 1925	Aug. 1925	Nov. 1924
PIG IRON				
Bessemer, valley, del., Pittsburgh	$22.76	21.46	20.76	22.11
Basic, valley	20.00	18.70	18.00	19.25
Basic, eastern del., eastern Pa.	23.00	20.50	20.50	21.46
*No. 2 foundry, del., Pittsburgh	22.26	20.96	20.26	21.36
No. 2 foundry, Chicago	23.00	21.60	20.50	21.00
*Southern, No. 2, Birmingham	21.00	19.25	18.00	17.90
*Southern Ohio, No. 2 Ironton	21.00	19.65	19.40	20.90
**No. 2X, Virginia furnace	28.00	26.00	23.00	24.50
**No. 2X, eastern, del. Phila.	24.26	22.61	21.76	22.98
Malleable, valley	20.50	19.20	18.50	19.75
Malleable, Chicago	23.00	21.60	20.50	21.00
Lake Superior charcoal, Chicago	29.04	29.04	29.04	29.04
Gray forge, val., del. Pittsburgh	21.76	20.46	19.76	20.76
Ferromanganese, del., Pittsburgh	119.79	119.79	119.79	107.29
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville furnace, ovens	4.50	5.65	3.10	3.00
Connellsville foundry, ovens	5.50	5.95	3.80	4.05
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	36.00	33.50	38.25	37.00
Sheet bars, open-hearth, Pittsburgh	36.00	35.00	35.00	37.00
Billets, open-hearth, Pittsburgh	35.00	35.00	35.00	35.50
Wire rods, Pittsburgh	46.00	45.00	45.00	45.50
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.00	2.00	1.95	2.05
Steel bars, Chicago	2.10	2.10	2.10	2.05
Steel bars, Philadelphia	2.32	2.27	2.27	2.295
Iron bars, Philadelphia	2.22	2.12	2.17	2.345
Iron bars, Chicago, mill	2.00	1.90	1.90	2.10
Beams, Pittsburgh	2.00	1.90	1.95	2.00
Beams, Philadelphia	2.17	2.17	2.17	2.12
Beams, Chicago	2.10	2.10	2.10	2.15
Tank plates, Pittsburgh	1.90	1.80	1.85	1.85
Tank plates, Philadelphia	1.97	2.02	2.12	2.02
Tank plates, Chicago	2.10	2.10	2.10	2.15
Sheets, black, No. 28, Pittsburgh	3.25	3.10	3.15	3.45
Sheets, blue anl., No. 10, Pittsburgh	2.40	2.25	2.30	2.60
Sheets, galvanized, No. 28, Pittsburgh	4.50	4.25	4.20	4.60
Sheets, black, No. 28, Chicago	3.50	3.35	3.35	3.65
Sheets, blue anl. No. 10, Chicago	2.65	2.45	2.45	2.85
Sheets, galvanized, No. 28, Chicago	4.75	4.45	4.40	4.75
Wire nails, Pittsburgh	2.65	2.65	2.65	2.75
Wire nails, Chicago	2.70	2.70	2.70	2.95
Tin plate per base box, Pittsburgh	$5.50	$5.50	$5.50	$5.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	19.50	18.40	19.25	19.85
Heavy melting steel, eastern Pa.	18.00	17.00	16.50	18.05
Heavy melting steel, Chicago	16.50	16.25	16.05	17.05
No. 1 wrought, eastern Pa.	18.75	18.25	18.25	18.95
No. 1 wrought, Chicago	17.50	16.30	17.45	17.10
Rails for rolling, Chicago	19.50	18.55	19.10	18.20

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Nov. 25, 1925)	$38.89
Last week (Nov. 18, 1925)	38.84
One month ago (October, 1925)	37.61
Three months ago (August, 1925)	37.39
One year ago (November, 1924)	39.00
Ten years ago (November, 1915)	28.64
Twelve years ago (November, 1913)	24.02

Late News Flashes

Chicago Moves Up Slightly

Chicago, Nov. 24.—Steel ingot operations have moved up a fraction of a point and approximate 86 per cent this week. Two independent steelmakers are operating at capacity. Of the 35 steel works stacks in this district 25 are active. Eight of the ten merchant stacks are blowing.

Valley Runs At Top Speed

Youngstown, O., Nov. 24.—Steelmaking schedules are at maximum capacity this week in the Mahoning valley where 88 per cent of the available 67 open-hearths are in operation. Sheetmakers have 95 per cent of hot mill capacity scheduled which is 1 per cent more than a week ago. Merchant bar mill activity is around 93 per cent.

Foreign Steel Sales Undiminished

New York, Nov. 24.—Sales of foreign steel to this country are undiminished and include mainly bars, angles and beams to jobbers in this territory and these products along with nails and barbed wire to consumers in the Southwest. A middlewestern agricultural implement manufacturer bought a considerable tonnage of foreign bars for use in manufactured products to be exported, thus allowing him the drawback of the duty.

Argue Claire Furnace Case

Washington, Nov. 24.—Arguments in the case of the Claire furnace and other iron, steel, coal and coke producers against the federal trade commission based on the latter's demand for monthly trade statistics, have been started. Solicitor General Mitchell, opening for the government, argues that the trade commission had authority to seek information to show conditions in the production and sale of steel and possibly as a base for legislation or court action. He held the case involves both intrastate and interstate commerce.

Pittsburgh Shows Some Irregularity

Pittsburgh, Nov. 24.—Operations are slightly lower in this area this week than last, averaging between 80 and 85 per cent. The Carnegie Steel Co. is on approximately an 81 per cent basis, with 34 of 54 blast furnaces active. The Jones & Laughlin Steel Corp. is understood to be planning to put on another furnace which will give it 11 out of 12 blowing. The Donora, Pa. mills of the American Steel & Wire Co., are running almost 100 per cent, with all open-hearth furnaces in operation. An additional blast furnace has been lighted, making both stacks active.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open hearth	$35.00
Pittsburgh, bessemer	35.00
Youngstown	35.00
Philadelphia	40.30 to 41.30
Chicago	35.00
Forging, Pittsburgh	40.00 to 45.00
Forging, Philadelphia	45.30 to 46.30

SHEET BARS

Pittsburgh	$35.00 to 36.00
Youngstown	36.00

SLABS

Pittsburgh	$35.00
Youngstown	35.00

WIRE RODS

¼-inch and finer

Pittsburgh	$46.00
Cleveland	46.00
Chicago	47.00

Standard extras, $2.50 per ton over ⅝-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	1.90c
Universal skelp, Pittsburgh	1.90c
Sheared skelp, Pittsburgh	1.90c

Structural Shapes

Pittsburgh	1.90c to 2.00c
Philadelphia	1.98c to 2.32c
New York	2.14c to 2.34c
Chicago	2.10c
Cleveland	2.09c to 2.19c
Birmingham	2.05c to 2.15c

Steel Plates

Pittsburgh	1.90c to 2.00c
Philadelphia	1.92c to 2.02c
New York	1.94c to 2.04c
Chicago	2.10c
Cleveland	1.99c to 2.09c
Birmingham	2.05c to 2.15c

Iron and Steel Bars

Pittsburgh, soft steel	2.00c to 2.10c
Pittsburgh, cold finishing	2.15c to 2.25c
Pittsburgh, forging quality	2.15c to 2.25c
Philadelphia, soft steel	2.32c to 2.42c
New York, soft steel	2.34c to 2.44c
Chicago, soft steel	2.10c
Cleveland, soft steel	2.19c
Birmingham, soft steel	2.15c to 2.25c
San Francisco, soft steel	2.60c
Pittsburgh, refined iron	3.00c to 4.50c
Pittsburgh, reinforcing billet	2.00c to 2.10c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	2.00c to 2.10c
Mill, rail steel	1.80c to 1.90c
Philadelphia, common iron	2.22c
New York, common iron	2.24c
Chicago, common iron	2.00c

Hoops, Bands, Strips

Hoops, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh over 6 in.	2.30c
Hot rolled strip steel, Pittsburgh stamping quality	2.30c to 2.50c
Hot rolled strip steel, Chicago	2.50c to 2.60c
Bands, Chicago, under 6 inches	2.60c
Bands, Chicago, 6 in. and over	2.50c
Cold rolled strip steel, hard coils, 1¼ inches and wider by 0.100-inch and heavier, base, Pittsburgh, Cleveland	3.90c
Worcester, Mass., Chicago	4.05c to 4.15c

Cold Finished Steel

Cold finished steel bars, drawn, or rolled Pittsburgh, Chicago carloads	2.50c
Less carload	2.75c
Steel shafting turned and polished Pittsburgh, Chicago	2.60c

Screw stock base Cleveland $1 higher; and Worcester $8 higher than Pittsburgh and Chicago.

Hot Rolled Alloy Steel

Pittsburgh or Chicago

S. A. E. Series—	
2300 (3½ per cent nickel)	4.60c to 4.75c
3100 (Nickel chromium)	3.60c to 3.65c
6100 (Chrome vanadium)	4.40c to 4.50c
9100 (Chrome vanad. spring)	3.85c to 4.00c
9250 (Silico-mang. spring)	3.30c to 3.40c

Billets—4 x 4 to 10 x 10, gross ton at net ton bar prices; under 4 x 4 to 2½ x 2½-inch $5 higher. Chicago base $2 higher.

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open- h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relaying rails, Pittsburgh	27.00 to 30.00
Light rails, 25 to 45 mill g.t.	36.00 to 38.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7-16-inch and smaller, Pitts	2.90c to 3.00c
Spikes, boat and barge, Pitts.	3.25c
Spikes, railroad, Chicago	2.90c to 3.00c
Track bolts, Pitts. standard	3.90c to 4.15c
Track bolts, Chicago	3.90c to 4.15c
Tie plates, Pittsburgh	2.35c
Tie plates, Chicago	2.35c

Wire Products

To Jobbers in Carloads

F.o.b. Cleveland and Pittsburgh base

Wire nails	2.65c
Galv'd nails smaller than 1-inch	4.90c
Galv'd nails, 1-inch and over	4.65c
Plain wire	2.50c
Annealed wire	2.65c
Galvanized wire No. 9 gage	3.10c
Barbed wire, painted	3.10c
Barbed wire, galvanized	3.35c
Polished staples	3.10c
Galvanized staples	3.35c
Coated nails, count keg	1.85c
Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts.	$20.03

Joliet, DeKalb and Waukegan, Ill., and Anderson, Ind., prices $1 per ton over Cleveland-Pittsburgh base on products made there; Chicago $1 higher; Duluth $2 higher and Worcester, Mass., and Fairfield, Ala., $3 higher.

Sheets

SHEET MILL BLACK

No. 28, Pittsburgh base	3.25c to 3.35c
No. 28, Philadelphia, delivered	3.67c
No. 28, Gary, Indiana Harbor	3.45c
No. 28, Chicago, delivered	3.50c

TIN MILL, BLACK

No. 28, Pittsburgh	3.25c to 3.35c
No. 28, Gary base	3.35c to 3.40c

GALVANIZED

No. 28, Pittsburgh base	4.50c to 4.60c
No. 28, Philadelphia, delivered	4.92c
No. 28, Gary, Indiana Harbor	4.70c
No. 28, Chicago, delivered	4.75c

BLUE ANNEALED

No. 10, Pittsburgh base	2.40c to 2.50c
No. 10, Philadelphia, delivered	2.82c
No. 10, Gary, Indiana Harbor	2.60c
No. 10, Chicago, delivered	2.65c

AUTOMOBILE SHEETS

No. 22, Pittsburgh base	4.40c to 4.50c

Tin Plate

Prices per 100-pound box, Pittsburgh

Tin plate, coke base	$5.50

Gary, Ind. base 10 cents higher.

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less and $4 per ton higher. Chicago delivered 2½ points less and $5 per ton higher.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3¼ to 3½-inch	46 off

Chain, Piling, Cut Nails

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.25c to 2.30c
Cut nails, c. l., f.o.b. mills	2.80c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$54.20
Six-inch and over, Chicago	50.20
Four-inch, Birmingham	46.00 to 47.00
Six-inch and over, Birmingham	42.00 to 43.00
Four-inch, New York	56.50 to 57.60
Six-inch and over, New York	51.50 to 52.60

Standard fittings, Birmingham base $110.00, 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B

Nuts and Bolts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Hot pressed square tapped or blank	$4.00 off list
Hot pressed hexagon tapped or blank	$4.40 off list
Cold punched square or hexagon blank	$4.10 off list
Cold punched square or hexagon tapped or blank	$4.10 off list
Cold punched U. S. S. semifinished hexagon nuts ⅝-inch and larger	75, 10 and 5 off
Cold punched U. S. S. semifinished hexagon nuts 9/16-inch and smaller	80, 10 and 5 off
Cold finished S. A. E. semifinished ⅝-inch and larger	75, 10, 10 and 5 off
Cold finished S. A. E. semifinished 9/16-inch and smaller	80, 10, 10 and 5 off

CARRIAGE BOLTS

(⅜ x 6-inch, smaller and shorter)

Rolled thread	50, 10 and 10 off
Cut thread (all sizes)	50 and 10 off
Eagle carriage bolts (Eagle list)	65 and 10 off

MACHINE BOLTS

(⅜ x 4-inch, hot pressed nuts)

Rolled thread	60 and 10 off
Cut thread (all sizes)	50, 10 and 10 off

(All sizes cold punched nuts)

Cut thread	45, 10 and 5 off
Lag screws	60, 10 and 10 off
Plow bolts Nos. 3 and 7 heads	50 and 10 off
All other standard heads	50 and 10 off plus 20 per cent
*Flat and round head stove bolts	80, 10 and 5 off
Tap bolts	30 off
Bolt ends with hot pressed nuts	50, 10 and 10 off
Bolt ends with cold punched nuts	45, 10 and 5 off
Blank bolts	50, 10 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size)	40 and 10 off
*Stove bolts 80, 10 and 5 off plus 2½ in bulk.	
Tire bolts	60 and 5 off

SEMIFINISHED CASTELLATED AND SLOTTED NUTS

Per 1000, f.o.b. producer's plant, freight allowed

	S.A.E. Castellated	U.S.S. Slotted
¼	$ 4.40	$ 4.40
5/16	5.15	5.15
⅜	6.20	6.60
7/16	7.90	9.00
½	10.10	10.50
9/16	13.80	14.20
⅝	17.00	17.30
¾	23.50	24.00
⅞	36.00	36.00
1	55.50	58.00
1⅛	89.00	89.00
1¼	126.00	131.00
1⅜	183.50	183.50
1½	210.00	210.00

Larger sizes—Prices on application

HEXAGON CAP SCREWS

Milled	80 and 10 off
Upset	80, 10 and 10 off

SQUARE HEAD SET SCREWS

Milled	80 and 5 off
Upset	80, 10 and 5 off

Rivets

Structural rivets, carloads, Pittsburgh and Cleveland	2.60c
Structural rivets, carloads, Chicago	2.75c
**Rivets, 7/16-in. and smaller Pittsburgh, Cleveland	70 and 10 off
**Rivets, 7/16 in. and smaller Chicago	70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought c.l., Chicago dist.	$6.30 to 6.40 off
Wrought c.l., Pitts dist	6.25 off
Lock Washers, f.o.b. factory	85 off

Pig Iron

Prices Steady, and Sales Continue in Fair Volume—Shipments Running Ahead of Third Quarter

RECENT heavy buying in the pig iron market has given way to a slower, but steady rate, with furnaces well booked ahead, and prices strong. Recent sales at St. Louis total 30,000 to 35,000 tons; furnace interests with headquarters at Cleveland report bookings for the week around 25,000 tons; melters in the eastern Pennsylvania have placed 15,000 tons. The valley market has stabilized at $20.50, base; the southern Ohio market is stronger, at $21 to $21.50; Birmingham furnaces have advanced from $21 to $22. At Buffalo the price range continues $21 to $22 for prompt and first quarter delivery, while some interests are quoting the lower price for the first quarter, and the higher for spot lots. Makers of silveries have advanced prices.

PITTSBURGH, Nov. 24.—Pig iron inquiries and sales still lag, although shipments against contracts continue high. This quarter's shipments by some prominent valley producers are exceeding the third quarter's by 25 to 40 per cent. The Altoona Iron Works is about to close for 500 to 1000 tons of gray forge iron. Several sales of foundry and malleable, 200 to 1000 tons at a time, originating further northward and westward, are noted, and several inquiries of that nature have been received. A price of $20.50, base valley is firm, and is quoted for prompt and first quarter. Single carloads of bessemer iron bring $21, valley. That price also is available for first quarter, although as in the case of basic iron no new inquiries for future shipment are current. The basic iron price is unchanged.

Boston, Nov. 24.—Pig iron sales have shown a slight reaction during the last few days in New England. One Pennsylvania furnace has sold No. 2X (2.25 to 2.75 silicon) for first quarter at $23 furnace, or $26.65 delivered. Some Buffalo iron for first quarter is offered at about the same delivered price. Several sales of Buffalo iron for second quarter are reported at $22, base, furnace. Foreign iron prices are unchanged, with moderate sales. The price of continental iron is close to $23 f.o.b. cars, Boston. Stocks of iron among New England foundries are unusually low, and inquiry is spreading to the small consumers.

Philadelphia, Nov. 24.—Pig iron business is in larger volume. Foundry sales here in the past week totaled 12,000 to 15,000 tons. Five thousand tons of basic also was sold, making the total for this grade 10,000 tons in the past two weeks. The basic iron price now seems firm at $22, furnace. About 1500 tons of low phosphorus iron was sold, including several hundred tons of English. Considerable basic iron now is being negotiated. Eastern furnaces are firm at $23, base furnace, for foundry iron, plus 50 cents for No. 2X, and $1 additional for No. 1X.

Buffalo, Nov. 24.—Pig iron inquiry totals about 5000 tons. Very little fourth quarter tonnage is unsold and first quarter backlogs have reached good proportions. There is a wide range of prices here on fourth and first quarter business. Low silicon foundry and malleable are quoted at $21 to $22 for both periods with some merchant interests reversing their positions on futures, some asking the top price for fourth quarter iron and others the maximum for first quarter. A new $20 quotation on basic is reported to have been made this week. Silicon differentials are asked on all business. Production was increased by the lighting of a fifth stack at Bethlehem's Lackawanna plant making 13 of 21 in the district in operation.

Pig Iron Prices

Prices per gross ton

Bessemer, valley	$21.00
Bessemer, Pittsburgh	22.76
Basic, valley	20.00
Basic, Pittsburgh	21.76
Basic, Buffalo	20.00 to 20.50
Basic, del., eastern Pa.	22.75 to 23.75
Malleable, valley	20.50 to 21.00
Malleable, Pittsburgh	22.26 to 22.76
Malleable, del., Cleveland	22.26 to 22.76
Malleable, Chicago	23.00 to 23.50
Malleable, Buffalo	21.00 to 22.00
Malleable, del., eastern Pa.	24.25 to 24.75
No. 1X, eastern del., Phila.	25.26
No. 1X, Buffalo	22.50 to 23.50
No. 1 foundry, Chicago	23.50 to 24.00
No. 2 foundry, valley	20.50 to 21.00
No. 2 foundry, Pittsburgh	22.26 to 22.76
No. 2 foundry, Buffalo	21.00 to 22.00
No. 2 foundry, Chicago	23.00 to 23.50
No. 2 foundry, Granite City	23.50 to 24.00
No. 2 foundry, Ironton fur.	21.00 to 21.50
No. 2 foundry, del., Cleveland	22.26 to 22.76
No. 2 foundry, del., Phila.	23.76 to 24.76
No. 2 foundry, N. J., tidewater	24.39 to 24.76
No. 2X, eastern del., Phila.	24.26 to 25.13
No. 2X, east. N. J., tidewater	24.89 to 25.76
No. 2X, eastern del., Boston	26.65 to 27.65
No. 2X, foundry, Buffalo furnace	21.50 to 22.50
No. 2X, Buffalo, del., Boston	26.91 to 27.41
Continental foundry f.o.b. Boston	22.50 to 23.50
India, 2.25 to 2.75 silicon, delivered cars Boston	23.00 to 23.50
No. 2 Alabama, Birmingham	21.00
No. 2, Alabama, Cincinnati	25.05
No. 2 Tenn., Birmingham	20.00
No. 2 Tenn., Cincinnati	24.05
No. 2 southern, Philadelphia	27.01
No. 2 southern, Chicago	27.01
No. 2 southern, Chicago (barge and rail)	25.18
No. 2 southern, Boston (rail and water)	26.91 to 27.91
No. 2 southern, Cleveland	27.01
No. 2 southern, St. Louis	26.17
No. 2X, Virginia furnace	22.50 to 23.50
No. 2X, Virginia, Phila.	27.67 to 28.67
No. 2X, Virginia, Jersey City	28.04 to 29.04
Gray forge, eastern Pa.	23.00 to 23.50
Gray forge, val. del. Pitts.	21.76
Low phos., standard, valley	28.00 to 28.50
Low phos., standard, Phila.	26.79 to 27.79
Low phos., Lebanon, furnace	25.00
*Low phos., English	24.51 to 25.01
Charcoal, Birmingham	30.00 to 32.00
Charcoal, Superior, Chicago	29.04

Silvery iron Jackson county, Ohio furnace, 5 per cent $26.50; 6 per cent $27.50; 7 per cent $28.50; 8 per cent $29.50; 9 per cent $31.00; 10 per cent $33.00; 11 per cent $35.00; 12 per cent $37.00; 13 per cent $39; and 14 per cent $41.00.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 per cent $35.00; 11 per cent $37.00; 12 per cent $39.00; 13 per cent $41.00; 14 per cent $43.00; 15 per cent $45.50; 16 per cent $48.00; 17 per cent $50.50.

*Duty paid, delivered Philadelphia consumers.

Cleveland, Nov. 24.—Pig iron prices are steady, with sales during the last week slightly below those of the week preceding. The total amount booked by furnace interests with headquarters here was 20,000 to 25,000 tons, including one lot of 4000 tons. Sales approximating 2500 tons were made by outside furnaces for shipment into Cleveland, local furnaces still being out of the market. These sales were made on a base price of $20.50, valley, equivalent to $22.26, delivered. The Otis Steel Co. has been compelled to blow out one of its two stacks here, and repairs will take 30 days or more. Sales elsewhere are noted at $20.50 to $21, base, valley, $23 to $23.50, lake furnaces west of Cleveland; and $21, Ironton. Some Buffalo furnaces are selling at $22, base, for this quarter, and $21 for next quarter, the reverse of the usual price situation being due to tightness in supplies for this quarter. A leading merchant furnace interest's November shipments now are assured as the largest month's record in the company's history. The Andrews Steel Co., Newport, Ky., is about to close on its inquiry for around 25,000 tons of basic iron. Jackson county makers have advanced silveries and bessemer ferrosilicon iron $1 for this quarter, and $1 additional for the first quarter. The sale of 500 tons of low phosphorus iron in this district is noted at $28.50, valley.

Chicago, Nov. 24.—Northern malleable and No. 2 foundry iron are quoted at $23 to $23.50, Chicago furnace. Contracts and some spot shipments are being made on the basis of $23, but an occasional sale of spot iron commands 50 cents higher. Furnace capacity in this district over the next four months is well sold and consequently not so much tonnage remains to be covered. Nevertheless, selling is mounting up in the aggregate and this week's activity probably will exceed last weeks. Practically no re-

sale iron is heard of. Holdups on contracts are less numerous than requests to expedite shipments. Low phosphorus iron is quoted at $31.20 to $31.70, delivered Chicago. Last month's sales of charcoal iron at $29.04, delivered Chicago, were the highest of any month this year. Southern iron is quoted at $20 to $21, Birmingham, with barge iron $25.18, delivered Chicago.

Cincinnati, Nov. 24.—Bessemer ferrosilicon and silvery iron prices have been advanced $1 for shipment over the balance of this year and additional for first quarter. Recent heavy bookings by producers of northern foundry iron in the Ironton district have strengthened the market. No. 2 foundry now ranges from $21 to $21.50 furnace. Southern iron is quoted $20 to $22, Birmingham, the former quotation applying to Tennes-

(*Concluded on Page* 1371)

Ferroalloys

Good Ferromanganese Sales Made—First Quarter Buying Not Started

New York, Nov. 24.—Fully 2000 tons of ferromanganese was sold last week including domestic, English, Norwegian and German. Ferromanganese continues firm at $115, duty paid tidewater. First quarter buying has not really started yet. Spiegeleisen sales are small, and spot lots have been closed at $34, furnace, for 20 per cent grade.

Special ferroalloys are active and firm. Contracts have been made for next year in silicon and chrome, and a number more probably will be made in the next week or two. The minimum price on ferrotungsten now is $1.10, with asking prices running to $1.18 in some instances. Wolframite is $11.62 to $12 a unit.

Pittsburgh, Nov. 24.—Within the next two or three weeks, ferroalloy sellers generally anticipate active buying. For the moment only desultory interest is encountered. The ferromanganese price remains unchanged at $115, seaboard base, and while a few of the smaller users have contracted for first quarter, there is a tendency to postpone such action among the larger consumers. Additional 50 per cent ferrosilicon contracts have been written for first half, the books having been opened, as indicated in IRON TRADE REVIEW last week, at $85 freight allowed. Spot spiegeleisen activity is limited. Shipments of this material as well as all other alloys are heavy.

Chicago, Nov. 24.—Fair buying of spiegeleisen for first quarter delivery has been under way the past week on the basis of $34, domestic furnace. Ferromanganese buying also has been somewhat more active, with the market $115, seaboard.

Ferroalloy Prices

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	$115.00
Ferromanganese delivered Pittsburgh	119.79
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	34.00
Ferrosilicon, 50 per cent contract freight allowed	85.00
Ferrotungsten standard, cents per pound contained	1.10 to 1.18
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, delivered	11.50
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.25 to 4.00
Ferro-carbon-titanium, car lots, producer's plant, net ton	200.00
Ferrophosphorus, electrolytic, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent material	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23 to 25 per cent, f.o.b. Anniston, Ala., (24 per cent material)	122.50

†Duty paid

Coke

Beehive Furnace Grade Eases Off, Now $4.50 to $5—Larger Coke Supplies Available

EASIER conditions now prevail in the coke market due to recent favorable weather conditions, larger supplies, and the adjustment of labor difficulties in the Connellsville region. The spot beehive furnace coke market has declined 50 cents in the week, and now is $4.50 to $5. Furnace interests are not buying ahead, some of them being assured of supplies on good terms.

Pittsburgh, Nov. 24.—Prospects in the beehive coke market are centered in weather conditions. Continued cold soon would absorb surplus stocks in the East and at ovens for anthracite substitutes, some of which now are being disposed at sacrifice figures. The spot market has declined an additional 50 cents since a week ago and now is $4.50 to $5. Sometimes coke of questionable quality sells at $4 or less. Medium sulphur coke is around $3.50 and $3.75. The largest inquiry current involves 15 carloads of heating coke weekly for the duration of the winter. Several sales of standard furnace coke for filling in tonnages at blast furnaces, ten or 15 carloads at a time, brought $4.50. A few tentative inquiries have been received for metallurgical coke for first quarter. None are being closed. A few blast furnaces have been assured they will be taken care of properly. Sales of standard selected foundry coke are few. The usual price is $6. Some coke is available at $5.50. Premium brands still command higher figures. Foundries are less anxious to contract for first quarter than a week ago when it seemed labor disturbances would spread throughout the region. These difficulties now apparently are well in hand.

Production of coke in the Connellsville region for the week ended Nov. 14 was 191,800 tons, compared with 199,000 tons the preceding week, according to the Connellsville Courier.

Boston, Nov. 24.—The decline at Connellsville has not affected the New England coke market. Foundry demand is urgent. The price is unchanged at $13 delivered.

Philadelphia, Nov. 24.—Foundry coke is bringing $6.50 to $8, Connellsville, depending on the brand. Spot furnace coke has sold at $5 and $5.25.

Detroit, Nov. 24.—Demand for foundry coke is steady. The price remains at $8.50 a ton, ovens. Cold weather is increasing demand for domestic coke which is unusually active.

Cincinnati, Nov. 24.—Producers and sellers of by-product foundry coke are renewing contracts for next year. The seller of the Indianapolis brand has sufficient contracts to cover the year's output which will aggregate 240,000 tons. The outstanding sale of the week was 6000 tons of 48-hour furnace fuel to a user in this district. Prices generally are firm, but run-of-oven beehive furnace fuel which is being substituted for the domestic grade because of its scarcity is somewhat easier.

New York, Nov. 24.—Beehive foundry coke is unchanged at $6.50 to $7.50, Connellsville. Some brands bring $8. Buying is fair. One producer is renewing first quarter and first half contracts with a wage clause. The price is not disclosed. Furnace coke is lower; $4.50 to $4.75, Connellsville. By-product foundry coke is $11.01 to $11.52 delivered at Newark and other northern New Jersey points.

Birmingham, Ala., Nov. 23.—A little easing in demand is noted in coke. Quotations are less firm, sales being made at $5.75 for the spot foundry grade. Lower prices are quoted.

Coke Prices

Beehive, Ovens

Prices per net ton

Connellsville, furnace	$4.50 to 6.00
Connellsville, foundry	5.50 to 7.00
New River foundry	7.50 to 8.00
New River furnace	6.25
Wise county furnace	6.00
Wise county foundry	7.00
Alabama foundry	5.50 to 6.00
Alabama furnace	5.50

By-Product

Foundry, Newark, N. J.; del.	$11.01 to 11.52
Foundry, Chicago, ovens	10.50
Foundry, New England, del.	13.00
Foundry, St. Louis	10.00
Foundry, Granite City, Ill	10.00
Foundry, Birmingham	5.50 to 5.75

Plates

Large Tonnages Involved in Recent Car Awards—Miscellaneous Tank Business Fair

CURRENT plate inquiries in the Chicago district, for tank and car work, involve 20,000 tons. Cars awarded at Chicago in the past two weeks will require 100,000 tons of steel, mainly plates and axles. Twenty-five thousand tons of plates involved in the New York Central's recent order for 4500 cars have been placed with Pittsburgh mills.

PLATE PRICES, PAGE 1356

Chicago, Nov. 24.—In the past two weeks Chicago district car builders have received awards requiring fully 100,000 tons of heavy finished steel, mostly plates, and axles. This is greater than the total buying of these builders in the third quarter. The Standard Oil Co. is expected to close today on 5000 to 6000 tons of plates for tanks and stills at Casper, Wyo. Cosden & Co. may close this week on its big tank inquiry for the Oklahoma field. Including these two oil jobs, 20,000 tons of plates are required by current inquiry. The Santa Fe railroad is inquiring for 900 tons for tanks. Plate deliveries are deferred three to four weeks and bookings are heavier than shipments. Plates are firm at 2.10c, Chicago.

Boston, Nov. 24.—A moderate tonnage of plates sold recently to a Massachusetts consumer at 1.65c, Pittsburgh, or 2.015c delivered. Larger tonnages still command 1.60c.

Philadelphia, Nov. 24.—Plate buying is better. The market is 1.65c to 1.75c, Pittsburgh. The former price 1.60c, seems to have disappeared.

Pittsburgh, Nov. 24.—Miscellaneous plate tonnages are numerous and specifications against contracts are liberal. Whereas some large buyers already are under contract for first quarter, one or two makers such as Bethlehem Steel Corp., start this week to protect their customers. The current market price is 1.90c minimum, and while some 2.00c quotations have been made, this has been on small quantities only.

For 4500 cars recently placed by the New York Central, 25,000 tons of steel mostly plates will be supplied by Pittsburgh mills.

Cleveland, Nov. 24.—Stiffening of plate prices still si backward. While more business is being placed at 1.90c Pittsburgh and orders come in better voluntarily at that level, there still are soft spots and 1.80c and 1.85c appear at times. Deliveries are more of a factor and this makes buyers unwilling to pay higher prices for assured early shipment. About 1000 tons of plates are involved in 25 additional locomotives for the New York Central. Several thousand tons of oil still work and a round tonnage for pending lake vessels are pending.

Cincinnati, Nov. 24.—Gas holders placed during the week account for 6800 tons of plates. The Louisville & Nashville railroad has purchased 800 tons of plates and sheets from the Tennessee Coal, Iron & Railroad Co.

CONTRACTS PLACED

5000 tons, gas holder at Buffalo, N. Y., to Stacey Bros. Gas Construction Co.
1800 tons, gas holder, St. Louis County Gas Co., Webster Grove, Mo., to Stacey Mfg. Co.
1300 tons, eight barges for the Island Creek Coal Co., Huntington, W. Va., to the Riter-Conley Co.
300 tons, tanks for California Petroleum Corp., San Francisco, to Steel Tank & Pipe Co.
200 tons, plates and shapes, stand pipe for the city of Dayton, O., to the Pittsburgh-Des Moines Steel Co.
185 tons, tanks for California Petroleum Corp., San Francisco, to Western Pipe & Steel Co.
130 tons, addition to pipe line for East Bay Water Co., Oakland, Calif., to Steel Tank & Pipe Co.
100 tons, pipe line for Western States Gas & Electric Co., Stockton, Calif., to Steel Tank & Pipe Co.
500 tons, 54-inch pipe line, Seattle, to T. A. Gillispie Co., New York.

CONTRACTS PENDING

3000 tons, penstock for Feather River Power Co., San Francisco; pending.
1300 tons, pipe line, Seattle, Wash.; bids in.
900 tons, work for Santa Fe railroad; pending.
535 tons, penstock at Guernsey, Wyo., for United States reclamation service; pending.
425 tons, small tanks for Pan American Petroleum Corp., Los Angeles; pending.
300 tons, pipe line for Auburn, Wash.; went wood pipe.
300 tons, pipe line for Western Water Co., Los Angeles; pending.

Semifinished

Sheet Bar Price Clarified at $36, Valley and Pittsburgh; Shortage Indications Appear

A CONSIDERABLE tonnage of sheet bars have been sold during the week at $36, valley, and also at $36, Pittsburgh, definitely establishing the market at that price. Some valley mills are practically sold up for first quarter on sheet bars, billets and slabs, and indications of a shortage are beginning to appear. The market is more active than in several weeks.

SEMIFINISHED STEEL PRICES, PAGE 1356

Pittsburgh, Nov. 24.—As far as specifications against this quarter's business are concerned, the semifinished market is active. No new inquiries are out on sheet bars and no new sales recently have been recorded. The price generally is $35, some mills asking $36. Additional rerolling billet, forging billet and slab inquiries are up for consideration involving several thousand tons. Pressure upon makers is becoming so severe that before the week is out those who have not done so probably will announce the basis for first quarter commitments. It is expected that the rerolling billet and slab price will be unchanged at $35, Pittsburgh, but that the forging billet differential of $5 from that level will be increased. Specifications against $40 forging billet contracts are voluntarily furnished, manufacturers of forgings, etc., being active. While specifications against $45 wire rod contracts were a trifle more numerous after the $46 price was announced, no new business has been transacted at the higher level. Skelp is inactive at 1.90c although contract renewals shortly will come out.

Philadelphia, Nov. 24.—Some first quarter rerolling billets have been sold at $36, Pittsburgh. Otherwise business is confined to small prompt lots at $35 to $36, Pittsburgh, for rerollers, and $40 to $41 for forging billets. Several thousand tons of sheet bars have been closed for first quarter at $36, Pittsburgh. Several first quarter wire rod contracts were closed at $46, Pittsburgh.

Youngstown, O., Nov. 24.—Semifinished steel commitments during the past two weeks have been so heavy that little if any tonnage will be available for the open market during first quarter. Many sheet producers have contracted heavily for first quarter sheet bar tonnages at $36, Youngstown, while tentative arrangements have been made by other sheetmakers. A few billet and slab sales have been entered for first quarter at $36, Youngstown, for small sizes and $35 for 4 x 4-inch and larger billets and slabs of equivalent size. A shortage of billets and slabs in this district is indicated for first quarter. Only one mill at present has tonnage available.

Cleveland, Nov. 24.—Recent sales of sheet bars have more clearly defined the price as $36, valley. This figure applied on more than 10,000 tons of sheet bars, booked by one seller during the week, for shipment in the valley and northern Ohio districts, in the first quarter.

Iron and Steel Scrap Prices

Corrected to Tuesday Noon. Gross Tons Delivered to Consumer

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	14.00 to 14.50
Boston (dealers)	12.50 to 13.50
Buffalo	18.00 to 18.50
Buffalo, No. 1	19.50
Chicago	16.25 to 16.50
Cincinnati (dealers)	14.00 to 14.50
Cleveland	17.50 to 18.00
Detroit	15.50 to 16.00
Eastern Pennsylvania	18.00
Bethlehem delivery	17.00 to 17.50
New York (dealers)	12.50 to 13.00
Pittsburgh	19.50 to 19.75
St. Louis	16.00 to 16.50
Valleys	18.50 to 19.00

COMPRESSED SHEETS

Buffalo	18.00 to 18.50
Chicago	14.25 to 14.75
Cleveland	15.50 to 15.75
Detroit	13.25 to 13.75
Pittsburgh	18.00 to 18.50
Valleys	17.00 to 17.50

BUNDLED SHEETS

Buffalo	15.00 to 15.50
Cincinnati (dealers)	10.50 to 11.00
Cleveland	12.50 to 12.75
Eastern Pennsylvania	15.00
Pittsburgh	17.00 to 17.50
St. Louis	10.25 to 10.75
Valleys	15.25 to 15.75

SHEET CLIPPINGS, LOOSE

Chicago	9.50 to 10.00
Cincinnati	10.50 to 11.00
Detroit	10.50 to 11.00

STEEL RAILS, SHORT

Birmingham	14.00 to 14.50
Buffalo	19.50 to 20.00
Chicago	20.00 to 20.50
Cincinnati (dealers)	18.00 to 18.50
Cleveland (over 6 ft.)	16.75 to 17.00
Detroit	17.00 to 17.50
St. Louis	19.25 to 19.75

STOVE PLATE

Birmingham	14.00 to 14.50
Boston (consumers)	14.00 to 14.50
Buffalo	15.00 to 15.25
Chicago	17.25 to 17.75
Cincinnati (dealers)	11.00 to 11.50
Cleveland	13.75 to 14.00
Detroit (net tons)	13.25 to 13.75
Eastern Pennsylvania	15.00
New York (dealers)	10.50 to 12.00
Pittsburgh	14.00 to 14.50
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo	20.50 to 21.00
Cincinnati (dealers)	18.50 to 19.00
Eastern Pennsylvania	21.00 to 22.00
Pitts. billet and bloom crops	24.00 to 24.50

SHOVELING STEEL

Chicago	16.00 to 16.50
Pittsburgh	15.00 to 15.50
St. Louis	15.75 to 16.25

KNUCKLES, COUPLERS, SPRINGS

Chicago	19.50 to 20.00
Eastern Pennsylvania	20.50 to 21.50
Pittsburgh	22.50 to 23.00
St. Louis	18.00 to 18.50

FROGS, SWITCHES, GUARDS

Chicago	18.50 to 19.00
Eastern Pennsylvania	17.00 to 17.50
St. Louis	18.50 to 19.00

ANGLE BARS—STEEL

Buffalo	16.50 to 17.00
Chicago	19.50 to 20.00
St. Louis	17.25 to 17.75

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	13.00 to 13.50
Boston (dealers)	13.50 to 14.00
Buffalo, No. 1	15.75 to 16.25
Buffalo, No. 2	18.50 to 19.00
Chicago, No. 1	17.50 to 18.00
Chicago, No. 2	16.25 to 16.75
Cincinnati, No. 1 (dealers)	11.00 to 11.50
Cleveland, No. 1	13.75 to 14.25
Eastern Pennsylvania	18.50 to 19.00
New York, No. 1 (dealers)	15.00 to 16.00
Pittsburgh, No. 1	15.50 to 16.00
Pittsburgh, No. 2	19.50 to 19.75
St. Louis, No. 1	15.00 to 15.50
St. Louis, No. 2	16.00 to 16.50

WROUGHT PIPE

Boston (dealers)	12.00 to 12.50
Buffalo	15.00 to 15.50
Eastern Pennsylvania	16.50 to 17.00
New York (dealers)	12.75 to 13.25

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	17.00 to 17.50

BUSHELING

Buffalo	17.50 to 18.00
Chicago, No. 1	14.25 to 14.75
Chicago, No. 2	10.00 to 10.50
Cincinnati, No. 1 (dealers)	14.00 to 14.50
Cleveland, No. 1	14.75 to 15.00
Cleveland, No. 2	14.25 to 14.50
Eastern Pennsylvania	14.00 to 15.00
Pittsburgh, No. 1	17.00 to 17.50
St. Louis, No. 1	14.00 to 14.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 8.50
Boston (chemical)	9.50 to 10.00
Buffalo	13.25 to 13.75
Chicago	10.00 to 10.50
Cincinnati (dealers)	10.50 to 11.00
Cleveland	13.75 to 14.00
Detroit	11.25 to 11.75
Eastern Pennsylvania	15.00
New York (dealers)	10.00 to 10.50
Pittsburgh	15.00 to 15.50
St. Louis	10.00 to 10.50
Valleys	12.50 to 13.00

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	8.00 to 8.50
Boston (chemical)	11.50 to 12.00
Boston (dealers)	9.50 to 10.00
Buffalo	13.25 to 13.75
Chicago	13.50 to 14.00
Cincinnati (dealers)	10.50 to 11.00
Cleveland	14.75 to 15.25
Detroit	11.75 to 12.25
Eastern Pennsylvania	14.50 to 15.00
Eastern Pennsylvania (chem.)	17.00 to 17.50
New York (dealers)	10.50 to 11.00
Pittsburgh	15.00 to 15.50
St. Louis	13.00 to 13.50
Valleys	13.50 to 13.75

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	9.00 to 9.50
Buffalo	13.00 to 13.50
Cincinnati (dealers)	10.50 to 11.00
Cleveland	14.75 to 15.00
Detroit	11.75 to 12.25
Eastern Pennsylvania	13.50 to 14.00
New York (dealers)	10.25 to 10.75
Pittsburgh	15.00 to 15.50

PIPES AND FLUES

Chicago	13.00 to 13.50
Cincinnati (dealers)	9.50 to 10.00
Cleveland	12.25 to 12.50
St. Louis	12.50 to 13.00

RAILROAD GRATE BARS

Buffalo	14.50 to 14.75
Chicago	17.50 to 18.00
Cleveland	13.75 to 14.00
Eastern Pennsylvania	15.00
New York (dealers)	11.50 to 12.00
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	10.00 to 10.50
Buffalo	14.50 to 15.00
Chicago	11.50 to 12.00
Cleveland (under 10 in.)	14.25 to 14.50
Cleveland (over 10 in.)	14.25 to 14.50
Detroit	11.50 to 12.00
Pittsburgh	16.00 to 16.50

FORGE SCRAP

Boston (dealers)	10.00 to 10.50
Chicago	19.50 to 20.00
Eastern Pennsylvania	14.50 to 15.00

ARCH BARS AND TRANSOMS

Chicago	24.00 to 24.50
St. Louis	22.50 to 23.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	10.00 to 10.50
Buffalo	15.00 to 15.50
Chicago	14.25 to 14.75
Cleveland	15.25 to 15.50
Eastern Pennsylvania	15.50 to 16.00
Pittsburgh	18.00 to 18.50
St. Louis	13.50 to 14.00

STEEL CAR AXLES

Birmingham	18.00 to 20.00
Boston (shipping point)	17.50 to 18.00
Buffalo	20.00 to 20.50
Chicago	19.75 to 20.25
Cleveland	18.00 to 18.50
Eastern Pennsylvania	24.00 to 25.00
Pittsburgh	23.00 to 23.50
St. Louis	20.50 to 21.00

SHAFTING

Boston (shipping point)	18.50 to 19.00
Chicago	21.75 to 22.25
Eastern Pennsylvania	23.00 to 23.50
New York (dealers)	18.50 to 19.50
St. Louis	18.00 to 18.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	16.00 to 16.50
Boston (consumers)	17.50 to 18.00
Buffalo, iron	17.00 to 17.50
Buffalo, steel	19.50 to 20.00
Chicago, iron	18.50 to 19.00
Chicago, steel	19.50 to 20.00
Cincinnati	14.00 to 14.50
Eastern Pennsylvania	18.50 to 19.00
New York iron (dealers)	14.00 to 15.00
Pittsburgh, iron	19.00 to 19.50
Pittsburgh steel	22.00 to 22.50
St. Louis, iron	18.00 to 18.50
St. Louis, steel	19.00 to 19.50

NO. 1 CAST SCRAP

Birmingham, cupola	17.00 to 17.50
Boston	19.00 to 19.50
Buffalo	17.00 to 17.50
Chicago, No. 1 machinery	21.00 to 21.50
Chicago No. 1 railroad or agricultural	19.50 to 20.00
Cincinnati No. 1 Machinery cupola (net tons dealers)	19.00 to 19.50
Cleveland, cupola	18.00 to 18.50
Detroit (net tons)	15.00 to 15.50
Eastern Pennsylvania, cupola	18.50 to 19.00
New York, cupola (dealers)	15.00 to 15.50
Pittsburgh, cupola	17.50 to 18.00
San Francisco, delivered	20.00 to 21.00
Seattle	18.00
St. Louis, railroad	17.00 to 17.50
St. Louis, agricultural	17.00 to 17.50
St. Louis, machinery	19.00 to 19.50
Valleys	18.00 to 18.50

HEAVY CAST

Boston	17.00 to 17.50
Buffalo (breakable)	16.50 to 17.00
Cleveland	13.00 to 13.50
Detroit (automobile) (net tons)	20.00 to 20.50
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	14.50 to 15.00
Pittsburgh	17.50 to 18.00

MALLEABLE

Boston, railroad	19.00 to 19.50
Buffalo	20.00 to 20.50
Chicago, agricultural	17.00 to 17.50
Chicago, railroad	19.00 to 19.50
Cincinnati, railroad (dealers)	14.50 to 15.00
Cincinnati, agricultural (dealers)	15.50 to 16.00
Cleveland, agricultural	18.50 to 18.75
Cleveland, railroad	19.50 to 20.00
Detroit	16.00 to 16.50
Eastern Pennsylvania, railroad	17.00
Pittsburgh, railroad	20.50 to 21.00
St. Louis, agricultural	15.50 to 16.00
St. Louis, railroad	16.75 to 17.25

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	18.00 to 18.50
Boston (dealers)	13.00 to 13.50
Buffalo	18.00 to 18.50
Chicago	19.50 to 20.00
Cleveland	17.25 to 17.50
Eastern Pennsylvania	18.50 to 19.00
New York	15.50 to 16.00
Pittsburgh district	22.00 to 22.50
St. Louis	19.25 to 19.75

LOCOMOTIVE TIRES

Chicago, No. 1	18.25 to 18.75
Chicago, cut	19.50 to 20.00
St. Louis, No. 1	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	18.50 to 19.00
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	21.50 to 22.00

Scrap

Moderate Buying and Little Change in Price Activity Is Displayed by Eastern Buyers

LITTLE change is taking place in the market for iron and steel scrap, buying being light for most part as consumers wait. Dealers are active and profess belief activity would bring substantial advances. Sufficient supply seems available and users indicate no concern. Buying seems better in the East than elsewhere. Prices have moved narrowly.

Chicago, No. 24.—The iron and steel scrap market as a whole continues heavy. Heavy melting steel warrants a range of $16.25 to $16.50, or 25 cents under the recent top. The supply of steel is large and melters will not pay more than $16.50. Dealers are buying steel for $16.25 to $16.35. Scrap as a whole seems plentiful and melters manifest no concern over supplies. An occasional railroad offering commands more than the market but the tonnage is small.

Boston, Nov. 24.—Continued buying of steel scrap by large Pennsylvania consumers has stimulated trading in New England. It is estimated that 2000 tons of steel scrap have been purchased in New England during the week for shipment to Pennsylvania and Ohio at about $13 shipping point. Consumers within the district have bought steel at $15 delivered.

New York, Nov. 24.—Some improvement is noted in consuming demand for scrap but most trading is among dealers, with speculation factor. Prices continue virtually unchanged. Dealers in several instances have been forced to sacrifice their profits in covering on contract involving borings and skeleton steel, which are scarce.

Philadelphia, Nov. 24. — Eastern mills other than the Bethlehem Steel Co. brought a total of at least 10,000 tons of heavy melting steel in the past few days at $17.50 to $18, mainly the latter. This figure now appears the minimum. Other scattered sales involve fair tonnages of other grades.

Pittsburgh, Nov. 24.—Sales of heavy melting steel scrap in at least two directions, Verona and Vandergrift, Pa., are noted at $19.75; others have brought $19.50. Large tonnages are not involved and the trade believes heavy inquiry would lift the market to $20. The Monessen, Pa. user is offering to buy at $19.50 but Midland, Pa. and Weirton, W. Va. and other nearby users are offering only $19. An embargo at Brackenridge, Pa. has closed one outlet for machine shop turnings. The highest offers on this grade here are $15 but some sellers are holding out for $15.50.

Buffalo, Nov. 24.—The Donner Steel Co.'s purchase of No. 1 heavy melting steel at $19.50 is reported complete but dealers say a market for material at this price is still afforded. Ideas of values of ordinary heavy melting steel range upward from $18 with some dealers expressing belief no tonnage could be acquired for less than $19.

Cleveland, Nov. 24.—Iron and steel scrap movement shows little change from week to week, buying being mostly among dealers as consumers are going little beyond contract specifications. Shipments are somewhat freer, no embargoes now being in effect. Prices are unchanged but fairly strong.

Detroit, Nov. 24.—The slight increase of strength in iron and steel scrap the past two weeks continues to hold, but no further increase is noted. Large consumers are somewhat conspicuous by their absence, most activity being among dealers. Small tonnages continue to make up the bulk of the tonnage being moved.

Cincinnati, Nov. 23.—The iron and steel scrap market here is at a standstill. The embargo into the Portsmouth, O., district by the Wheeling Steel Corp. a week ago has been partially lifted. Dealers' buying prices are holding firm as offerings by producers are small.

St. Louis, Nov. 23.—Iron and steel scrap prices held steady with the exception of heavy melting and shoveling steel, which were down 25 cents per ton.

Railroad offerings have dropped off sharply, as compared with the liberal marketings of recent weeks. The only list out was of 1000 tons by the Missouri Pacific. The Burlington and several other western roads are expected to have out offerings within the next week.

Birmingham, Nov. 23.—While recent advances in iron and steel scrap have not stopped buying, activity is less. Dealers make most activity, buying to fill contracts.

Sheets

Mills Firming Up on Prices for First Quarter, with Buyers Waiting—Specifications Heavy

SHEET mills with order books practically filled for this quarter, and operations near capacity, are taking a firmer attitude toward new business, and many of them are holding for the higher prices announced for first quarter. The leading producer the week came up to the $2 advance announced by independent producers the previous week.

SHEET PRICES, PAGE 1356

Pittsburgh, Nov. 24.—Little room is left on sheet makers' books for additional orders outside of common black sheets to be shipped this year; hence, the minimum figures quoted largely are nominal and the maximum levels better represent the market. The spreads are as follows: 2.40c to 2.50c on blue annealed, 3.25c to 3.35c on black, 4.50c to 4.60c on galvanized, and 4.40c to 4.50c on full finished. Some of the independent producers announced the maximum figures for first quarter and indicated that additional business would be accepted for delivery this quarter at the old prices. Others like the American Sheet & Tin Plate Co. have made the higher prices effective immediately. The leading interest announced the new levels Nov. 19 after several independents had inaugurated the change. The American company has signed up several thousand tons of sheet orders for January shipment, including 5000 tons of full finished, 3000 tons in one order, at the new figures. Demand still is diversified and production and shipments are high. Output generally is averaging 85 to 90 per cent, the leading interest being on a basis slightly higher than 88 per cent. The American Sheet & Tin Plate Co. on Nov. 19 also advanced long ternes $2 per ton, the base going to 4.85c, and terne plates were advanced similarly.

Boston, Nov. 24.—Demand for sheets is close to a high point for the year at Boston. Several round tonnage orders of galvanized sheets have been placed at 4.40c Pittsburgh. Black sheets waver between 3.15c and 3.25c Pittsburgh.

Philadelphia, Nov. 24.—First quarter sheet business is being signed. A number of contracts are closed at the new prices, 2.50c, Pittsburgh, for blue; 3.35c for black and 4.60c for galvanized. Eastern mills are operating full, scheduling one to four weeks ahead.

Buffalo, Nov. 24.—Another advance of $1 a ton on black sheets has been put in effect by Buffalo mills, bringing the new quotation to 3.35c, Pittsburgh. Buffalo mills are operating at capacity. The latter is greater by 50 per cent than that heretofore reported. Automobile sheets are quoted at 4.50c for first quarter, with orders heavy. Practically no open tonnage is available this year.

Youngstown, O., Nov. 24.—Most sheetmakers in this district are insisting that buyers specify tonnages now under contract to permit the mills to make definite arrangements for future sheet bars. While some producers still are in a position to supply sheet tonnage for December, many mills have notified sales offices to take no more orders. The market is quoted at 2.50c for blue annealed, 3.35c for black and 4.60c for galvanized and as far as can be learned, these prices are firm. First quarter entries are being made while the tonnage involved has not reached large proportions, nearly every producer reports bookings. Sheet mill operations this week are at 95 per cent of capacity and if all the tonnage now on the books is specified, the mills will maintain this schedule throughout December. A canvass of the Detroit consumers of full-finished sheets indicates that no letup in demand for first quarter tonnages is contemplated. Specifications from this branch of the trade now in the hands of producers assures full working schedules through December. First quarter tonnage is quoted at 4.50c for No. 22 gage, the consumer taking 25 per cent of the wasters arising in the execution of tonnage 21 gage and lighter, and 15 per cent in the case of 20 gage and heavier.

Chicago, Nov. 24.—Inland Steel Co. and American Sheet & Tin Plate Co. are quoting 4.70c, Gary or Indiana Harbor, for galvanized sheets, 3.45c for black and 2.60c for blue annealed. The respective delivered Chicago prices are 4.75c, 3.50c and 2.65c. This is an advance of $2 and business through the entire first quarter is being booked at these levels. Orders for galvanized and black sheets have backed up three to four weeks and for blue annealed four to six weeks. Western sheet mill operations are practically at capacity.

St. Louis, Nov. 24.—Sheet prices continue strong. Specifications and shipments are unusually high for this time, and operations by the leading local producer are at full capacity. Makers of galvanized sheet products are inquiring for first quarter requirements.

Tin Plate

Current Prices Reaffirmed for First Half—Market Active

TIN PLATE PRICES, PAGE 1356

Pittsburgh, Nov. 24.—While independent tin plate producers expected that the first quarter and first half price would be higher, and while the increased cost of pig tin would warrant at least a 15-cent advance, the American Sheet & Tin Plate Co. Nov. 19, and other manufacturers since, have reaffirmed the $5.50 level for the first quarter to jobbers and for the first half to manufacturers. Black plate is 3.35c for first quarter only. Orders have been coming in and as far as the leading interest's western mills are concerned enough business has been booked to keep them fully occupied for seven months. The two large canmakers have taken all the tonnage that can be spared them from those units. The Standard Oil Co. of New Jersey whose inquiry was for first and second half requirements, and the Standard Oil Co. of California whose inquiry was for 10 months' needs, did not receive quotations beyond June 30. So far as is known here, neither has closed. Operations generally are high, the average being above 90 per cent with the leading interest maintaining an 83.5 per cent basis.

Strip Steel

Mills Have Good Backlogs and Much Business To Be Placed

STRIP PRICES, PAGE 1356

Pittsburgh, Nov. 24.—While there may be some withholding of hot and cold rolled strip steel specifications because of the desire to cut down inventory stocks, producers have no doubt that all shipping instructions on this quarter's contracts will be in hand by the middle of December. As noted last week, books have been opened for first quarter at 2.30c on wide hot strips, 2.50c on narrow hot strips, and 3.90c on cold. Producers generally are not pressing customers to sign contracts but a few large automobile producers already have contracted so that the mills have good backlogs. Operations are 80 to 85 per cent of capacity.

Runs Many Months

The blast furnace of the Robesonia Iron Co., Robesonia, Pa., was blown out Nov. 19 for relining, following a successful blast of 25 months. The company expects to resume operations in about 30 days.

Dallas Brass & Copper Co., Chicago, has increased its capital stock from $1,000,000 to $1,300,000.

Pipe

Mill Operations Steady at 70 to 75 Per Cent—Cast Iron Pipe Buying Is More Active

AN AMERICAN maker underbid French interests on 17,000 tons of cast pipe for Detroit. The French maker booked 2000 tons from New England companies. New York water department will be in the market soon for 10,000 tons, its early requirements. Pipe mills continue to operate about 70 to 75 per cent of capacity. Buttweld orders are heavy.

PIPE PRICES, PAGE 1356 AND 1388

Detroit, Nov. 24.—The United States Cast Iron Pipe & Foundry Co. was a shade lower than B. Nicoll & Co., New York, representing a French maker, in the opening of bids on 17,000 tons of cast iron pipe at Detroit, Nov. 23. The tonnage was divided into 3300 of 6-inch, 5700 of 8-inch, and 4000 each of 12 and 16-inch. The freight rate from Birmingham to Detroit is $7.92.

The United States company bid $47.95, delivered, on the 6 and 8-inch and $45.95 on the 12 and 16-inch, but $45.30 if awarded the entire tonnage.

B. Nicoll & Co. bid $46.69 on the 6-inch, $46.17 on the 8-inch, $45.32 on the 12-inch and $45.12 on the 16-inch.

The American Cast Iron Pipe Co. bid $49.95 on the 16-inch. The Lynchburg Foundry Co. bid $45.30 on half of the 12 and half of the 16-inch. The bid of James B. Clow & Son was $48.60 on 2000 tons each of 6 and 8-inch and 1000 tons each of 12 and 16-inch.

Boston, Nov. 24.—Gas companies in New England are active in the cast iron pipe market. A Connecticut company has placed 2000 tons and a Massachusetts company wants over 2000 tons. Several other gas companies expect to cover tonnage for 1926 in the near future. Prices are exceptionally firm.

New York, Nov. 24.—Trading in cast pipe is undergoing a seasonal lull, although the market is still strong with pipemakers booked into next year on most sizes. B. Nicoll & Co., representing French interests has closed on four jobs within the past week for New England gas companies, involving in the aggregate 2000 tons. The early requirements of the local water department are now estimated at close to 10,000 tons. It is likely business will be brought out in two different lots.

Pittsburgh, Nov. 24.—Buttweld pipe orders are heavy in the aggregate although individual orders usually are small. Standard full weight pipe jobbers are ordering solely to round out their stocks. Jobbers are making a marked effort to keep down inventory stocks. Oil country jobbers usually order a single carload or two of casing or other oil country goods, but a rise in the price of oil yesterday may encourage drillers and quicken demand. Pipe mills still operate on a 70 to 75 per cent average.

Chicago, Nov. 24.—Cast iron pipe bookings continue almost to equal shipments. Practically full operations

at the pipe mills over the remainder of the year are assured. On business in this district the quotation is $50.20, delivered Chicago, for pipe 6-inch and over, and $54.20 for 4-inch pipe.

Birmingham, Ala., Nov. 23.—Lettings of cast iron pressure pipe are steady. Winter business is coming up to expectations. Spring promises more business than for the past two years. Several large contracts are in sight for coming year. Prices in general are steady.

CONTRACTS PLACED

1300 tons, Halfway, Mich., 1000 tons to United States Cast Iron Pipe & Foundry Co., and 300 tons to National Cast Iron Pipe Co.
2000 tons, four gas company jobs in New England to B. Nicoll & Co., representing French interests.
190 tons, 4 and 6-inch class B pipe for Santa Ana, Calif., to National Cast Iron Pipe Co.
100 tons, 14-inch class B pipe for Antioch, Calif., to United States Cast Iron Pipe & Foundry Co.

CONTRACTS PENDING

1780 tons, 16 to 24-inch class B and C pipe for Los Angeles; bids in.
1445 tons, 6 to 20-inch class B pipe for Newport Beach, Calif.; bids in.
1400 tons, Providence, R. I., bids reported rejected; up for new bids. B. Nicoll & Co. were low.
550 tons, Wewoka, Iowa; bids in Dec. 7.
221 tons, 4 and 6-inch class B pipe for Sunnyvale, Calif.; bids opened.
200 tons, 30-inch class B pipe for San Diego, Calif.; bids open Nov. 27.
100 tons, 4 to 8-inch class B pipe for Cloverdale, Calif.; bids opened.

Bolts, Nuts, Rivets

First Quarter Prices Expected To Be Unchanged from Present

NUT AND BOLT PRICES, PAGE 1356

Chicago, Nov. 24.—Present quotations on bolts and nuts, with the possible exception of stove bolts, seem likely to carry over into first quarter. One maker is about to open first quarter books. Stove bolts will advance, if anything. Bolt and nut works are operating at 80 per cent, a gain of 5 per cent. Large machine bolts are 50, 10 and 10 off. Structural rivets are quoted at 2.75c.

Philadelphia, Nov. 24.—Demand for bolts and nuts is further improved but there is no indication yet as to the price for first quarter while rivets maintain 2.40c to 2.50c Pittsburgh.

Pittsburgh, Nov. 24.—Steadily trending toward improvement, nut, bolt and rivet producers are getting ready to start this week booking first quarter output. It is expected the discount of 50, 10 and 10 off for large machine bolts will again be the basis. The current quotation on rivets is 2.60c although large quantities are being shipped at lower figures against old contracts. The nut and bolt operating rate is 75 to 80 per cent.

Bars

First Quarter Contracts Being Signed With No Advance—Buying Heavy

FIRST quarter contracts for steel bars are being signed and 2.00c, Pittsburgh, seems to be the prevailing quotation. Many important users are covered for their requirements. Buying is heavy, in many instances the best of the year, and specifications are being filed fully. Producers are able to meet most requirements of users, though deliveries are deferred.

BAR PRICES, PAGE 1356

Chicago, Nov. 24.—Bookings of soft steel bars continue to exceed shipments. The demand for small section bars is unusually heavy. Consumers are running on extremely low stocks. While deliveries are becoming more deferred, mills are satisfying requirements. The leading independent may open books within the week for January business; instead of booking through first quarter this interest will book on a 30-day basis. The market on soft steel bars is firm at 2.10c, Chicago. The general opinion is that this level will last out the quarter, but reports of an advance of $2 in the near future continue current.

Bar iron is firmer at 2.00c, Chicago, and a good inflow of railroad business is looked for. Doubleturn operations prevail at rail steel mills. All classes of consumers are heavy buyers and the market is tending more strongly toward a single price of 2.10c, Chicago.

Boston, Nov. 24.—Bar sales at Boston during the past week probably reached the high total for the year. Heavy orders have been placed by forging plants, strip steel makers, and the building industry. Total sales for the week are estimated at 10,000 tons. The price is firm at 2.00c, Pittsburgh.

Philadelphia, Nov. 24.—Some makers of steel bars find current business the best this year. A number of first quarter contracts have been signed at 2.00c to 2.10c, Pittsburgh. The minimum now seems to be 2.00c.

Buffalo, Nov. 23.—Bar demand has been brisk for the past two weeks. One of the largest makers in this district now has greater unfilled tonnage on its books than at any time since 1920. Production has practically doubled within the past 90 days. The 2.265c, Buffalo, price can still be had although some makers are trying to establish 2.365c, equivalent of 2.10c, Pittsburgh.

Pittsburgh, Nov. 24.—No difficulty is being experienced by merchant steel bar producers in obtaining specifications against this quarter's contracts. Many only await the word from their sources of supply to sign first quarter contracts. The price apparently will be 2.00c. Numerous customers of some of the larger makers, such as Carnegie Steel Co., are already protected. Operations are high, between 90 and 100 per cent being the general average. The Bethlehem Steel Corp. has started a new 9-inch bar mill at the Cambria works, Johnstown, its 13-inch bar mill there having been started two weeks ago.

Cleveland, Nov. 24.—More contracts for bars for first quarter have been closed at 2.19c, Cleveland or 2.00c, Pittsburgh which remains the going price for either prompt or forward shipment. Specifications are heavy. While with some sales offices November tonnage to date materially exceeds the large volume in October, with others it is less. Deliveries are becoming more spread out and users are exerting pressure to get deliveries. Mill capacity is filled on small sizes of bars for from four weeks to two months. A similar condition applies to very large sizes.

Hoops and Bands

Production Full and Specifications Being Filed Steadily

HOOP PRICES, PAGE 1356

Pittsburgh, Nov. 24.—Specifications against this quarter's hoop and band contracts are being received at a rate which shows they will all be taken out by Nov. 30 or early in December. Some first quarter contracts at the new figure of 2.50c have already been received and others are due to come in this week. Operations of hoop and band mills are practically on a 100 per cent basis.

Chicago, Nov. 24.—Sales of bands have been heavy recently and the present levels of 2.50c, Chicago, for 6-inch and over and 2.60c for less than 6-inch are firm.

Cold Finished Steel

Demand Best In Three Years For Many Producers

Pittsburgh, Nov. 24.—Cold bar finishers describe their present business as the best in three years. Specifications are being furnished in large tonnages. The price is firm at 2.50c, and the new extras are applying, customers offering no criticism. Contracts are being written for first quarter and operations continue 80 to 85 per cent.

Structural Shapes

Seasonal Slowup Beginning to Appear—Fabricators and Mills Well Booked Ahead—Prices Steady

BUYING in the structural market is beginning to reflect the seasonal tendency somewhat, although the slowup is less in evidence than in some previous years. New work coming to architects' boards is less in abundance but inquiry still is numerous. Fabricators are booked ahead 90 days in some sections, and a few mills are receiving heavier specifications than they can meet. Few large tonnages are moving and the past week was devoid of heavy awards or inquiries.

Prices on plain material are firmer but no advances have been established as yet. Equivalent to 1.90c to 2.00c Pittsburgh still is quoted in most cities and on small lots the maximum is firm. Fabricated prices show no change.

STRUCTURAL SHAPE PRICES, PAGE 1356

New York, Nov. 24.—While structural activity has included few large orders, the total volume of business is being well maintained, and the heavy amount of work on architect's boards indicate little letup for sometime to come. Fabricated material prices, while firmer, have shown no gain. Desirable plain material business can still be placed at the 1.90c, Pittsburgh, but it is difficult for a buyer to shade that.

Boston, Nov. 24.—Activity in small structural jobs continues heavy but larger projects are being put over to 1926. The old Parker House, Boston, is being torn down to make way for a new hotel. Shape prices hold firm at 1.85c to 1.90c, Pittsburgh.

Philadelphia, Nov. 24.—Heavy structural shape business was placed with eastern mills, involving considerable tonnage for stocks for fabricating plants. The largest eastern mill now is operating full, others are at 80 per cent. The minimum on plain material now appears 1.90c, Pittsburgh, although a number of buyers were given an opportunity to cover for the remainder of the year at a lower cost. Most eastern makers quote the equivalent of 1.90c to 2.00c, base.

Pittsburgh, Nov. 24.—Routine business for structural shape fabricators still constitutes the activity in this section. The formal award of the Liberty bridge is to take place this week, coming as indicated two weeks ago, to the Independent Bridge Co. Bids have been rejected on the Central police station here and new tenders are being asked. Structural shapes are quoted at 1.90c to 2.00c, although the maximum figure is usually named on any new business that comes up.

Buffalo, Nov. 24.—Structural demand holds up well although the usual seasonal decline in building is reported. Fabricators are busy. The going price is 2.265c, Buffalo, with occasional reports that 2.165c, or 1.90c, Pittsburgh, is quoted to larger users.

Chicago, Nov. 24.—Recent structural awards have not been heavy but are sufficient to insure 1925 building awards approximating, if not exceeding, 1923. Local fabricating shops have about 90 days' business on their books. Specifications to the mills for plain material exceed shipments. Plain material is firm at 2.10c, Chicago, with some speculation whether an advance will come prior to the first quarter.

Cleveland, Nov. 24.—Decreasing inquiries and awards are being met by local structural fabricators. Small tonnage lots still are numerous and they aggregate a fair total. Plain material sales usually are small and are carrying 1.90c to 2.00c Pittsburgh quotations.

Awards Compared

	Tons
Awards this week	19,230
Awards last week	25,189
Awards two weeks ago	56,848
Awards this week in 1924	94,062
Average weekly awards, Oct.	38,175
Average weekly awards, 1925	33,732

CONTRACTS PLACED

2550 tons, bank for the Seamen's Church institute, New York, to Taylor-Fichter Steel Construction Co.

2200 tons, American Railway Express terminal, Long Island City, N. Y., to the Shoemaker Bridge Co.

1600 tons, Brooklyn State hospital, Creedmore, L. I., to the Owego Bridge & Structural Co.

1500 tons, loft, 15 West Forty-seventh street to the Hedden Iron Construction Co. This award was noted last week, but a different tonnage was reported.

1400 tons, Consolidated Gas & Electric Co. building, Baltimore, to Belmont Iron Works.

1400 tons, Eacker apartment, 500 Madison avenue, New York, to the Taylor-Fichter Steel Construction Co.

1400 tons, two viaducts for the Florida East Coast railroad, to the Virginia Bridge & Iron Co.

1400 tons, Atlantic, Gulf & Pacific Co., Manila, P. I., to United States Steel Products Co. and Bethlehem Steel Co.

1200 tons, Bryant Park building, Forty-second street, New York, to the Taylor-Fichter Steel Construction Co.

1000 tons, county bridge for Harris county, Houston, Tex., to the American Bridge Co.

900 tons, state prison, Wingdale, N. Y., to Eastern Bridge & Structural Co.

800 tons, office, 117 Liberty street, New York, previously noted as placed, went to the Hay Foundry & Iron Works.

700 tons, bridge for the Reading Co., at Ft. Clinton, Pa., to the Bethlehem Steel Corp.

600 tons, Shupe Terminal Co., Port Newark, N. J., to an unnamed fabricator.

585 tons, trusses and columns for Skinner building, Seattle, to Hofius Steel & Equipment Co., Fifth Avenue Building Co., Seattle, owner.

500 tons, apartment for T. E. Rhodes, 66 East Seventy-ninth street, New York, to Taylor-Fichter Steel Construction Co.

500 tons, additional catenary structure for Illinois Central railroad electrification work, Chicago, to Continental Bridge Co.

400 tons, building for Sheffield Farm, Webster avenue and 165th street, New York, to Levering & Garrigues Co.

300 tons, foundry addition for the De Laval Steam Turbine Co., Trenton, N. J., to the McClintic-Marshall Co.

300 tons, building for Standard Oil Co. at Indianapolis, to Insley Mfg. Co.

300 tons, plant at Belleville, N. J., to unnamed fabricator.

250 tons, addition to Gillette Safety Razor Co. plant, Boston, to New England Structural Co.

210 tons, Brighton telephone exchange building, Boston, to New England Structural Co.

200 tons, railroad bridge for the Woodward Iron Co., Woodward, Ala., to the American Bridge Co.

175 tons, bakery, Elmira, N. Y., to American Bridge Co.

150 tons, including bins for the Westinghouse Airbrake Co., Wilmerding, Pa., and dust collecting systems for the Standard Sanitary Mfg. Co., New Brighton, to the W. N. Kratzer Co.

150 tons, Y. W. C. A., Buffalo, to Kalman Steel Co.

135 tons, armory, Westfield, N. J., to Belmont Iron Works.

125 tons, machine shop, Elizabeth, N. J., to American Bridge Co.

100 tons, angles for Atlantic, Gulf & Pacific Co., Manila, P. I., to Pacific Coast Steel Co.

CONTRACTS PENDING

4000 tons, Plant Department store addition, Newark, N. J.; bids asked.

3000 tons, silk mill for the Viscos Corp., Parkersburg, W. Va.; bids being taken.

2500 tons, hotel, West Fifty-fourth street, New York; pending.

2000 tons, new Parker house hotel, Boston; present building being torn down.

2000 tons, bridgework for Louisville & Nashville railroad, bids in Nov. 30.

2000 tons, 23-story insurance center building, John street, New York; pending.

1500 tons, Shrine temple, Oakland, Calif.; bids being received.

1500 tons, office building, Seventeenth street, Oakland, Calif.; bids being taken.

1500 tons, Vantage Ferry bridge, Vantage Ferry, Wash.; bids in Dec. 12.

1100 tons, girls Catholic high school, Philadelphia; McKenna & Little, general contractors.

1000 tons, Thirteenth and Filbert Office building, Philadelphia; long pending, expected to be revived early in 1926.

850 tons, Atwater bridge, Milwaukee; pending.

800 tons, Wilson building, Camden, N. J.; Roberts & Roller, general contractors.

750 tons, addition to the Ward Baking Co., Pittsburgh; bids being compiled in New York.

650 tons, hotel, Virginia Beach, Va.; pending.

600 tons, theater for Warner Brothers, Hollywood, Los Angeles; bids being received.

550 tons, bank of Hawaii, Honolulu; bids being received.

500 tons, building for the Old Dominion Distilling Corp., Norfolk, Va.; bids asked.

500 tons, Mason hotel, Jacksonville, Fla.; pending.

500 tons, Saint Clement school, Philadelphia; pending.

400 tons, Livingston apartment, New Brunswick, N. J.; pending.

375 tons, Thirty-ninth street bridge for Sanitary District of Chicago, 910 South Michigan boulevard, Chicago; Great Lakes Dredge & Dock Co., 104 South Michigan boulevard, Chicago, low bidder.

350 tons, public garage building for the Pittsburgh Garage Co., Third and Fourth avenues, Pittsburgh; bids being taken.

300 tons, building for the Gilmore Drug Co., Pittsburgh; bids in.

300 tons, building for the H. J. Heinz Co., Pittsburgh; bids in.

300 tons, Central police station, Pittsburgh; first bids rejected—new bids being asked.

250 tons, two bridges for the Atlantic Coast line; bids asked.

250 tons, Assumption academy, Worcester, Mass.; bids in.

300 tons, crane runway, roofs, etc., Universal Co., New York; pending.

200 tons, Piety street dock shed for port commissioners of New Orleans; pending.

175 tons, hotel, Page and Franklin streets, San Francisco; bids being received.

125 tons, filling station, Standard Oil Co., Washington; Clinton & Russell, 100 Maiden Lane, New York, architects.

100 tons, Grover Cleveland high school, Seattle West Coast Construction Co. awarded general contract.

100 tons, addition to the Ward Baking Co., Pittsburgh; bids being compiled in New York.

Several hundred tons, two public schools, Garden City, L. I.; pending.

Tonnage unstated, Shelton hotel, Philadelphia; Barras Construction Co. general contractor.

Tonnage unstated, Cooper hospital addition, Camden, N. J., pending.

Tonnage unstated, West Jersey hospital addition, Camden, N. J.; pending.

Tonnage unstated, dumping pier for city of Philadelphia; pending.

Concrete Bars

Market Spotty with Few Large Tonnages Moving—Mills Consider Raise

SPOTTY demand characterizes the concrete bar market. Some districts, such as Boston, are enjoying fair activity but most centers are finding diminishing buying. Inquiry consists mostly of small tonnage projects. Prices are firm but unchanged, although Buffalo district mills contemplate $2 a ton advance. Bars from stock are steady.

REINFORCING BAR PRICES, PAGE 1356

Chicago, Nov. 24.—November is shaping up exceptionally good in reinforcing bars and may prove to be the best November since 1919. For the season, an unusual volume of new work is coming out. Competition is sharp but the level of 2.60c, Chicago warehouse, for billet bars is firm. Rail steel bars are quoted at 2.00c to 2.10c, Chicago. A large amount of work is being placed quietly. Warehouse stocks are good. Shipments are heavy.

Boston, Nov. 24.—Marked improvement in concrete bar sales is reported by leading dealers, and while individual jobs are mostly under 100 tons the week's sales at Boston are known to have exceeded 2000 tons. The price is firm at 2.00c Pittsburgh.

Pittsburgh, Nov. 24.—Several concrete bar projects still are pending which involve promising tonnages. Awards this week have all been small. The price still is 2.00c to 2.10c.

Buffalo, Nov. 24.—Reinforcing bar inquiry includes one lot of 300 tons for a Buffalo school. There have been but few sales of bars. Sellers are understood to be considering an increase of $2 a ton on bars from mills, to 2.365c, Buffalo. Bars for city delivery by truck are quoted at 2.75c to 2.85c.

Cleveland, Nov. 24.—Dullness continues in the local concrete bar market. Small inquiries continue numerous but large tonnage projects are lacking. New billet bars are firm at 2.19c to 2.25c Cleveland, and rail steel bars now are quoted 1.80c to 2.00c, mill. Bars from stock continue 2.50c, Youngstown.

Awards Compared

	Tons
Awards this week	4,535
Awards last week	3,400
Awards two weeks ago	5,965
Awards this week in 1924	5,615
Average weekly awards, Oct.	5,973
Average weekly awards, 1925	6,141

CONTRACTS PLACED

1100 tons, addition to soldier's field stadium, Chicago, to Olney J. Dean & Co.; John Griffiths & Son Co., 112 West Adams street, Chicago, general contractor.

900 tons, Foster avenue sewer, Brooklyn, N. Y., to Concrete Steel Co.

700 tons, Steif apartment, 170 Delaware street, Chicago, to Inland Steel Co. McLennan Construction Co., 307 North Michigan avenue, Chicago, general contractor.

325 tons, Bank of Italy building, San Jose, Calif., to Truscon Steel Co.

200 tons, subway work, New York, to McClintic-Marshall Co.; T. A. Gillespie Co., general contractor.

170 tons, substructure, Sterling & Welch: Samman office building, and Banater hall, Lorain street, all in Cleveland, to Rivet Grip Steel Co.

150 tons, reservoir at Holland, Mich., to Concrete Steel Co.

150 tons Hercules Cement Co. building, Hercules, Pa., 125 tons to Truscon Steel Co., 25 tons to McClintic-Marshall Co.

150 tons, reconstruction John Evans apartment hotel, Evanston, Ill., to Kalman Steel Co. Victor C. Carlson, 636 Church street, Evanston, owner and contractor.

150 tons, Sears Roebuck building, Newark, N. J., to Igoe Bros.

140 tons, hotel, Pacific Grove, Calif., to Gunn, Carle & Co.

100 ton, church, Reno, Nev., to Truscon Steel Co.

100 tons, building for Mangrum & Otter, San Francisco, to Steel Service Corp.

100 tons, Lion Match Co. building, Long Island City, N. Y., to Igoe Bros.

100 tons, Loew threater, New York, to Truscon Steel Co.

CONTRACTS PENDING

1200 tons, two school buildings for Chicago board of education; B-W Construction Co., 720 Cass street, Chicago, general contractor.

800 tons, National Grocery Co. warehouse, Jersey City, N. J.; pending.

900 tons, Miami Athletic club, Miami, Fla.; bids close Nov. 30.

170 tons, 10-story apartment hotel for Albert O'Rourke & Co., 77 West Washington street, Chicago; pending.

100 tons, Masonic temple building, Norwood, O., General contract to Ferro Concrete Construction Co.

100 tons, Masonic building, Norwood, O., general contract to Ferro Concrete Construction Co.

100 tons, Protestant Children's home, Covington, Ky.; bids close Nov. 27.

Tonnage unstated, 16-story apartment hotel, Chicago, for Philip M. Gordon, 750 North Michigan avenue, Chicago. Plans by Guske & Foster, 750 North Michigan avenue, Chicago.

Tonnage unstated, Jewish People's institute, Douglas Boulevard and St. Louis avenue, Chicago; plans by E. A. Grunsfeld Jr. and E. H. Klaber, 81 East Madison street.

Tonnage unstated, 5-story addition to Werner Bros. Fireproof Storage Co., 2815 Broadway, Chicago; Ralph Sollitt & Sons Construction Co., 5 North La Salle street, Chicago, general contractor.

Tonnage unstated, 4-story hospital addition for St. Ann's hospital, 4900 Thomas street, Chicago; Herman J. Gaul, 228 East Superior street, Chicago, architect.

Tonnage unstated, theater at West Twenty-fifth street and South Fifty-third avenue, Chicago; E. P. Rupert, 6957 South Green avenue Chicago, architect.

Iron Ore

Market Quiet—Lake Shipments Drawing To Close

Cleveland, Nov. 24.—Shipments of Lake Superior iron ore to lower lake ports are near completion for the year. Current sales are small and the market is quiet. The amount of ore consumed in October was nearly 600,000 tons over that in September. The Lake Superior Iron Ore association gives the following details pertaining to consumption and amounts available.

	Tons
Ore consumed in September	4,010,826
Ore consumed in October	4,609,389
Increase in October	598,563
Ore consumed in Oct., 1924	3,407,702
Ore at furnaces Nov. 1, 1925	33,541,569
Ore on Lake Erie docks Nov. 1, 1925	7,656,229
Total at furnaces and Lake Erie docks Nov. 1, 1925	41,197,798
Total, Nov. 1, 1924	41,536,089

New York, Nov. 24.—Eastern furnaces have bought over 250,000 tons of North African ore, some for spot shipment, but most for next year. Algerian low phosphorus ore which was 9 to 10 cents a unit f.o.b. cars, Atlantic ports now is 9.75 to 10 cents. Further ore business is pending. It is understood fully 150,000 tons of Caucasian manganese ore has been purchased for first half shipment.

Rails, Cars

Western Roads Active—Car Buying Fair—Locomotive Inquiry Good

ACTIVITY of western railroads continues to feature the equipment market. Santa Fe is expected to close on 2850 cars immediately. Locomotive buying is better, Atlantic Coast Line closing on 45 with Wabash inquiring for 25, New York Central for 25 additional and Missouri Pacific for 15. Track accessory demand continues heavy, although not widespread.

RAILROAD TRACK MATERIAL PRICES, PAGE 1356

Chicago, Nov. 24.—Most western railroads having placed their 1926 rail business, it is apparent that the 1926 rolling of rails in this district will approximate that of 1925 and the secondary buying movement in the spring will bring in enough tonnage to top 1925. At present, the roads are concentrating on fastenings.

The leading interest booked 9000 tons of rails, in three small lots, last week. It also took 4000 tons of angle bars and 1500 tons of tie plates. The Pere Marquette is understood to have placed a small rail order. Its inquiry was for 12,000 tons. The Missouri, Kansas & Texas is expected in the market shortly. The Burlington, Rock Island, Nickel Plate and Clover Leaf have not yet placed their rails. Wabash railroad closed on 20,000 tons of 90 and 110-pound rails, 10,500 tons going to Illinois Steel Co., 6500 tons to Inland Steel Co., and 3000 tons to Bethlehem Steel Co. The Missouri Pacific, New York Central and Baltimore & Ohio still have big fastening inquiries pending. Last week's bookings of light rails were the heaviest in some months.

The Santa Fe has withdrawn 150 hopper coal cars from its inquiry, and may place today the 2850 cars still active. Chicago, Milwaukee & St. Paul will place repairs to 770 gondolas. Since mid-September, 20,000 freight cars have been placed. The Burlington and North Western are at work on car programs, while the rock Island, Illinois Central and Union Pacific, covering the Southern Pacific and Pacific Express, are expected to be market factors early in 1926.

The Inland Steel Co. has completed the delivery of four boatloads of nails to the Great Northern railroad at Duluth.

Boston, Nov. 24.—Increased activity has taken place in rail buying at Boston although the 1926 commitments still hold off. A Massachusetts street railway system placed an order for $10,000 worth of frog and switch material. The Grand Trunk is out for 7000 tons and the Boston & Maine for 15,000 tons.

Pittsburgh, Nov. 24.—Small orders for light rails continue. Some makers still quote around $36 per gross ton; others as high as $37 and $38. It is understood that the Baltimore & Ohio has purchased against its 17,000-ton tie plate inquiry and is distributing orders. New York Central and other railroads are negotiating for track fastenings. The price on standard spikes is 2.80c; small spikes apparently have stiffened and prices below 3.00c have disappeared. The tie plate price is unchanged at 2.35c minimum, and track bolts continue to be quoted at 3.90c to 4.25c.

New York, Nov. 24.—Two or three substantial inquiries for cars are included in the week's railroad activities. The Reading seeking 1000 and New York Central 5000 additional. A feature of the railroad equipment market is substantial buying of locomotives. The Atlantic Coast Line closed on 45 locomotives to the Baldwin Locomotive Works, and the Andes Copper Mining Co. on 10 industrial locomotives to the Westinghouse Electric International Co. Other orders include four for the Tennessee Central railroad, to American Locomotive Co., and five for the Central of Georgia, awarded the Baldwin Locomotive Works. Missouri Pacific contemplates building 15 switch engines in its own shops. The Wabash is inquiring for 25 switch engines and the New York Central system for 25 additional.

Heavy track accessories demand is noted. Both the Pennsylvania and Reading roads are inquiring for first quarter track bolts, spikes and other products.

ORDERS PLACED

Erie railroad, six combination cars, to the J. G. Brill Co.
Electric Gas Co., Chicago, 15 tank cars, to General American Tank Car Co.
Atlantic Coast Line, 2 baggage and mail cars, to American Car & Foundry Co.
Edinsburg Coal Co., 500 mine cars, to Bethlehem Steel Co.
Erie railroad, 68 coaches, to Standard Steel Car Co.

ORDERS PENDING

Chicago, Milwaukee & St. Paul, repairs to 770 gondolas; pending.
Delaware, Lackawanna & Western, 25 cabooses; pending.
New York Central, 500 hopper cars and 120 passenger cars; bids asked.
Paulista railway, 150 flat cars; pending.
Philadelphia & Reading, 1000 gondolas; pending.

Wire

Possible Advance and Change in Differential Considered — Business Steady

ADVANCE on wire and wire products for first quarter is hinted in the West, while a rumor is out that the former $5 differential between wire and nails may be established is heard in the East. Yet some mills have been selling for first quarter at the old figure. Buying is steady but inventory conservatism is holding back large tonnages until the end of the year.

WIRE PRICES, PAGE 1356

Chicago, Nov. 24.—Rumors are current of a possible $2 advance in wire and wire products beginning with first quarter, but presumably large users would have opportunity to cover at present levels. For the season, current business is encouraging. Mills are operating an average of 70 per cent and stock of common products are not heavy. Present quotations are 2.55c, Chicago or western mill, for plain wire and 2.70c for wire nails.

New York, Nov. 24.—The Texas Co. has placed heavy tonnages of wire nails and wire products for next year. The Standard Oil Co. of New Jersey has bought heavy quantities of wire nails also for 1926 delivery.

Pittsburgh, Nov. 24.—Wire products orders are coming in piecemeal as material is needed by jobbers and manufacturers.

A backlog of busines sis being dammed up, however, for release in January. There is still talk of price advances with a possibility of the restoration of the $5 spread between nails and wire, the present basis of 2.50c to 2.65c. Giving only $3 margin. Some mills, however, have been taking first quarter contracts at the old price basis. Operations average 60 to 65 per cent.

Sheet Mill Started

Birmingham, Ala., Nov. 24.—The new sheet mill of the Tennessee Coal, Iron & Railroad Co. has been completed, and President Crawford announced Monday that three of the mill units, with 3120 tons monthly output, began operating today. The other units are expected to be started within a few weeks. The plant cost about $2,000,000. Local consumers have placed orders for sheets, and Birmingham interests believe new industries will be induced to locate here.

Nonferrous Metals

Metals in Light Demand and Prices Sag Except on Zinc and Nickel—Shipments Large—European Situation Aids

Prices of the Week, Cents a Pound

	Copper: Electro delivered	Copper: Lake delivered	Copper: Casting refinery	Spot Straits Tin, N. Y.	Lead: New York	Lead: East St. Louis	Zinc: St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
	Cents per pound									
Nov. 18	14.62½	14.75	13.95	63.75	9.77½	9.60	8.47½	28.00	19.75	34.00
Nov. 19	14.50	14.62½	13.90	63.50	9.77½	9.50	8.57½	28.00	19.75	34.00
Nov. 20	14.50	14.62½	13.85	63.62½	9.75	9.50	8.65	28.00	19.75	34.00
Nov. 23	14.45	14.60	13.75	63.50	9.75	9.50	8.70	28.00	20.00	34.00
Nov. 24	14.37½	14.50	13.75	62.50	9.75	9.50	8.80	28.00	20.00	34.00

NEW YORK, Nov. 24.—Buying of nonferrous metals has been light the past week and prices have sagged on most kinds, with zinc and nickel exceptions. Shipments on old orders continue large and stocks are small in all hands, but European business is lagging and it is the prospect of larger stocks here on that account that causes some easiness.

Rolled products—Business of the rolling mills continues large in all metals, with emphasis on copper sheets. Buying has been a little quiet in the past week or so, as users are well covered for some weeks ahead and do not care to venture farther with ingot metals easy. Specifications against contracts are large and mills are shipping a greater tonnage than in a long time. Copper wire is in a comparatively slack market.

Zinc—The coating metal has recovered much of its loss of a week ago, present strength being due more to the difficulty of finding metal for shipment this year than to largeness of new demand. Strength in the London market also has been a factor, though the price level there still is low for export buying here. Prices in the accompanying table are for shipment of prime western this month. Prompt shipment on some days has commanded 5 to 10 points higher, while December generally has been 5 points and January 10 points less. Some business has been done on the latter.

Copper—The foreign market has been weak lately, so with the crisis in France it was easy for the prices abroad to sink farther. Here the market has been depressed by foreign news because users knew that despite their own big business, the producers were in need of export buying and in its absence the users could wait for cheaper metal. With large domestic consumption apparently assured for at least several months, and new supplies plentiful, the key to the price situation is the course of the foreign market.

Tin—Buying of this metal has been moderate lately, with the need mostly for spot and nearby. As shipments have been large from the Orient, it appears supplies will be plentiful in the new year, and consequently futures are not as high as nearer positions. Opening of books on tin plate for next quarter has not had visible effect on the tin market. Prices have fluctuated narrowly of late, with a little emphasis on easiness, and this condition is natural on account of the highness of prices.

Aluminum—Buying of aluminum has been moderate lately but shipments and specifications continue large, and prices are steady. A little more foreign metal appears available for the near future than the rate of the past year. Remelted and scrap still are firm.

Nickel—Contract prices are 2 cents higher for 1926, but a little under spot prices of the above table. Contract prices apply only to large lots.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
High brass	19.62½
Copper, hot rolled	23.25
Zinc, ga. 9 to 17	12.00
Lead full sheets (cut ¼c more)	13.50 to 14.00
Aluminum, bright flat, up to 10 gage	37.50
SEAMLESS TUBES	
High brass	24.25
Copper	25.25
RODS	
High brass (round ⅝ to 2½-inch)	17.37½
Naval brass	20.12½
WIRE	
Copper	16.37½ to 16.62½
High brass	20.00

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.00
Chicago	9.75
Cleveland	8.75 to 9.00
HEAVY YELLOW BRASS	
New York	7.00
Chicago	8.50
Cleveland	7.25 to 7.50
ZINC	
New York	5.25
Cleveland	4.75 to 5.00
HEAVY COPPER AND WIRE	
New York	11.75
Chicago	12.00
Cleveland	11.25 to 11.50
RED BRASS BORINGS	
New York	8.25
Cleveland	8.50 to 8.75
YELLOW BRASS TUBING	
Cleveland	7.25 to 7.50
LIGHT COPPER	
New York	9.75
Chicago	10.75
Cleveland	9.50 to 9.75
LIGHT BRASS	
Chicago	7.50 to 8.00
Cleveland	6.00 to 6.25
ALUMINUM	
Borings, Cleveland	15.00 to 16.00
Old sheet and cast, Cleveland	19.00 to 20.00
Clippings, Cleveland	22.00 to 22.50

Secondary Metals

Remelt aluminum No. 12	25.00 to 25.50
Brass ingot 85-5-5-5	12.25 to 12.50

Coke By-Products

Markets Less Active, but Undertone Is Strong

New York, Nov. 24.—Although a strong undertone prevails, distillates are unchanged. Pure and 90 per cent benzol continue on the same level at 24 cents a gallon in tanks and 29 cents in drums. Tuluol is quoted 30 cents a gallon in tanks and 35 cents in drums, with a further advance likely in the near future. Solvent naphtha is holding at 28 cents, works, in tanks and 33 cents in drums, and xylol at 29 cents in tanks, and 34 cents in drums.

Sulphate of ammonia is steady at $2.80 to $2.85 delivered, for domestic account and $2.70 port, for material in double bags for export. Current demand is slack, the bulk of production going into back contracts. Foreign demand has been particularly dull, and for a considerable time.

Naphthalene is experiencing a seasonal lull, with prices for nearby shipment holding at 5½ to 6½ cents for flakes and 6½ to 7½ cents for balls. On material for delivery next year the market is about ½-cent higher. Phenol is listless at around 22 cents, works.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contract
Pure benzol	$0.24	
Toluol	0.30	
Solvent naphtha	0.28	(nominal)
Commercial xylol	0.29	(nominal)
Phenol	0.22	
Per Pound at Producers' Plants		
Naphthalene flakes	0.05½ to 0.06½	0.06 to 0.07
Naphthalene balls	0.06½ to 0.07½	0.07 to 0.08
Per 100 Pounds Delivered		
Sulphae of ammonia	$2.82½	

Two continuous type annealing furnaces now are in operation at the Leechburg, Pa., plant of the West Leechburg Steel Co. The 60 x 120-foot extension to the company's 16-inch hot strip mill building will be ready for occupancy in December.

Coast Steel Is Cheaper

Lower Water Rate and Increase in Base Price Leaves Net Reduction

By Air Mail

SAN FRANCISCO, Nov. 21.—Of primary importance this week in the coast iron and steel markets was the reduction put into effect by members of the steamship conference of $3 a ton on tubular goods and $2 a ton on plates and shapes. Prior to this several non-conference members had been quoting these rates and the reduction was made that steel companies using conference lines might be relieved of absorbing the difference. Formerly the c.i.f. price on plates and shapes was 2.25c and 2.30c respectively. The present c.i.f. price is 2.15c on plates and 2.20c on shapes. Most steel companies immediately raised their base price $1 a ton and are quoting 2.20c and 2.25c c.i.f. on plates and shapes respectively. It must be understood that the lower c.i.f. price is due entirely to a water freight reduction and not to weakness in the base price of steel, for most companies are really getting $1 a ton more. Plates have been the most active but it has been a rather quiet week. Buying on the coast continues to involve tonnages for immediate consumption only and little or no speculative buying is noted.

Pig Iron and Coke

Dealers in pig iron and coke report a quiet week with orders being confined to small lots. No large inquiries are up for figures. Prices remain unchanged from last week.

Coast Pig Iron Prices

Columbia basic, San Francisco	$27.00 to 28.00
No. 2 Columbia, San Francisco	27.00 to 28.00
No. 2 Columbia, Los Angeles	27.00 to 28.00
No. 2 Columbia, Portland	27.50 to 28.50
No. 2 Columbia, Seattle	27.50 to 28.50
*Dutch	24.50 to 25.00
*Indian iron	24.00
*Belgian	25.00 to 25.50
*English (2.75-3.75 sil.)	26.50 to 27.00
*German	25.50 to 26.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Little improvement is seen in demand for merchant bars and local mills continue to quote 2.40c to 2.50c f.o.b. cars San Francisco as compared with a 2.35c c.i.f. price being named by eastern producers. Foreign bars are quoted at 1.85c to 1.90c c.i.f. duty paid with rumors of 1.80c having been named. Concrete bar awards this week aggregated over 1200 tons, the largest calling for 325 tons for the Bank of Italy in San Jose, Calif. One distributor reports booking over 1000 tons during the week, mostly small lots from 10 to 50 tons. Included among pending business is 250 tons for the Vantage Ferry bridge in Washington, bids on which will be opened Dec. 1.

Plate fabricators are pleased over the prospects as business pending exceeds 11,000 tons. New inquiries will be opened Nov. 23 and a pipe line at Chelan, Wash., calling for 10,000 feet of heavy pipe for a head of 284 feet. Awards totaled over 700 tons, the largest calling for 300 tons for tanks for the California Petroleum Corp., of San Francisco, placed with the Steel Tank & Pipe Co. Prices are now firm at 2.15c c.i.f. as a minimum but most companies have advanced $1 a ton and are quoting 2.20c c.i.f.

While fabricators of plain shapes are busy figuring on work calling for well over 16,000 tons, awards placed during the week involved only lots of less than 100 tons. Prices on domestic material are firm at 2.20c c.i.f. coast ports as a minimum with larger producers quoting 2.25c as a minimum. Some foreign material is arriving and the present quotation is 1.65c to 1.75c base, c.i.f. duty paid.

Other Finished Material

The Southern Pacific Co. has placed 1,500,000 tie plates, 3700 kegs of track bolts and 29,000 kegs of track spikes with various producers. The Northwestern Pacific, San Francisco, is asking for prices on 400 kegs of track spikes.

Awards of cast iron pipe involved only two projects this week and included 190 tons for Santa Ana, Calif., and 100 tons for Antioch, Calif. Pending tonnages aggregate over 3900 tons, new inquiries of the week calling for 1780 tons for Los Angeles and 200 tons for San Diego. Prices continue unchanged at around $50 a ton, base delivered.

Activity in sheets and wire has been confined to the usual run of small lots and little of importance has developed. The Standard Oil Co. has an inquiry out for 175,000 base boxes of tin plate.

Northwest Buys Little

SEATTLE, Nov. 18.—Buying of iron and steel products is marked by small tonnages with a firm tone to the market.

Reduction of iron and steel freights by water from Atlantic and Gulf to North Pacific ports from 40 cents to 30 cents per 100 pounds this week was the feature of the situation on this coast. Whether this action of the conference lines will affect the price of iron and steel products here is open to question. As far as known no manufacturers have cut their prices to correspond with the new water rates.

Iron and steel have been moving on a 40-cent rate from Atlantic and Gulf for more than a year. However, in recent months demand for lumber has attracted many tramp steamers into the intercoastal route and these vessels have been willing to cut conference rates on westbound cargo. As a matter of fact it is not believed the present reduction will affect the situation materially as it is evidently only official recognition by conference lines of a condition that has existed for some time.

The new tariff also covers iron and steel, including cast iron pipe, from Gulf ports to the North Pacific, which were 40 cents and are now moving at 30 cents.

The market is unchanged. There is little interest in these items as the plants are well stocked. Some price cutting has been reported and buyers are holding back in making commitments for first quarter delivery.

Bars, Plates and Shapes

The local mill is maintaining its level of 2.35c. Specifications are fairly good although the jobbing trade is buying sparingly. Local jobbers are working on a basis of 3.25c. At Portland foreign competition is keener and bars are still quoted there at about 2.85c. The largest job pending involves 175 tons for the Vantage Ferry bridge for which the state will open bids Dec. 1.

Plates and shapes are holding their own at 2.30c and 2.35c respectively although for large contracts and desirable tonnages 2.25c and 2.30c might be done. Bids for the Auburn, Wash., pipe line job, involving 380 tons of steel, are under consideration. Lower tenders for wood pipe were received. The entire improvement is estimated to cost $125,000. Nov. 23, bids will be opened for a reconstruction job on the Cedar river, a part of Seattle's water system. This job involves 8329 lineal feet of 54 and 48-inch lockbar steel pipe. Everett, Wash., will open bids Dec. 1 for steel pipe involving about 635 tons. Albina Marine Iron Works, Portland, has been awarded the contract for constructing two steel barges for the government on a bid of $24,484 each. Each barge will require 170 tons of steel.

Local jobbers report trade rather quiet. Sheets are in better demand than other items but all sales are in small tonnages for spot needs. Im-

Tin Plate Mills Are Organized

Ninety-Five Per Cent of South Wales Manufacturers Reported in Selling Syndicate, Effective Jan. 4—Japan Places 30,000 Boxes—French Competition Depressing German Market

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Nov. 24.—(*By Radio*)—About 95 per cent of the manufacturers of tin plate in South Wales have organized a selling combine, it is reported, effective Jan. 4. Japan has just contracted for 30,000 boxes of tin plate.

British steel prices are weak. Some good orders have been received during the week from South America.

British pig iron exports are improving, Middlesbrough furnaces meeting continental competition. Inquiries continue to be received from several American melters.

Depressing conditions in the German markets are reported in dispatches from Berlin. A few orders for steel bars have been taken for shipment to Japan, India and South America; some orders for rails also are noted. French competition is reported to be much more severe, and the French export business is active. The Belgian market has improved. A Belgian firm has obtained an order for 2500 tons of rails for shipment to Rumania.

British Outlook in Steel Is Decidedly Better

LONDON, Nov. 18.—(*European Staff Service*)—A more confident tone is noticeable in British pig iron, and although the steel industry continues depressed, continental competition in Great Britain has subsided to some extent, and the general outlook is more hopeful. There is less hand-to-mouth buying and more inclination to take care of future needs. A number of contracts for colonial engineering undertakings recently have been received. These include large mooring masts and airship sheds for India, six 72-ton tank engines for the Uganda railroads, bridge work for South American, Indian and Rhodesian railways, 21 steel cars for the South Indian railroads and the extension of a pier in Nigeria.

Recent American orders for British pig iron did much to ease the situation and stocks have decreased considerably in several districts. However, these export sales were at unremunerative prices and quotations are still on a low level, although fewer concessions are granted to buyers. A number of blast furnace stacks have been, or are about to be blown in. Export trade with the continent is at a low ebb, due to financial conditions, while French pig iron finds its way to Scotland. Continental pig iron prices are governed by the French, owing to the recent slump of the French franc, and foundry pig iron 2.5 to 3 per cent silicon is sold at £3 ($14.55), f. o. b. Antwerp.

Sterling $4.85

This compares with the British f. o. b. price of £3 3s 6d ($15.10). Swedish pig iron is offered in France at 130 kroner ($34.80), delivered Rouen.

British steel is exported in bridge and constructional work, India being a fairly good customer for the time being, one order being for 220 steel cars. However, French merchant bars have been sold to that market in competition with Belgium and Luxemburg. Both these countries are keenly feeling the effects of the depreciation of the French franc. It is reported from Paris that two-thirds of the orders for semifinished products are for export. Blooms are sold at £4 2s 6d $20) and billets at £4 8s 6d ($21.50). Bars are offered at £5 5s ($25.50) in competition with Germany. Continental competition in the

(*Concluded on Page* 1375)

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, November 23	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		Francs		Francs		£ s d
Foundry No. 3, Silicon 2.50-3.00	$16.01	3 6 0*	$14.05	365	$14.21	315	$16.98	3 10 0
Basic	15.76	3 5 0	14.82	385	14.66	325	15.04	3 2 0
Basic-bessemer	18.67	3 17 0†	14.05	365	14.21	315	16.98	3 10 0
Hematite. Phosphorus 0.02-0.05	18.07	3 14 6	18.67	485	.....	...	19.40	4 0 0
SEMIFINISHED STEEL								
Billets	$26.68	5 10 0	$20.24	525	$20.97	465	$26.68	5 10 0
Wire rods	44.86	9 5 0	26.76	695	27.51	610	29.10	6 0 0
FINISHED STEEL								
Standard rails	$35.16	7 5 0	$28.49	740	$28.86	640	$31.53	6 10 0
Merchant bars	1.57c	7 5 0	1.13c	640	1.15c	560	1.17c	5 6 0
Structural shapes	1.38c	6 7 6	1.05c	595	1.07c	520	1.18c	5 7 0
Plates, ship, bridge and tank	1.54c	7 2 6	1.21c	690	1.23c	600	1.38c	6 5 0
Sheets, black, 24 gage	2.22c	10 5 0	2.18c	1,240	2.15c	1,090	1.64c	12 0 0
Sheets, galvanized, 24 gage, corrugated	3.60c	16 12 6	3.04c	1,725	4.56c	2,225	3.69c	16 15 0
Bands and strips	2.22c	10 5 0	1.41c	800	1.48c	720	1.63c	7 8 0
Plain wire, base	2.38c	11 0 0	1.76c	1,000	1.74c	850	1.60c	7 5 0
Galvanized wire, base	3.03c	14 0 0	2.20c	1,250	2.26c	1,100	1.98c	9 0 0
Wire nails, base	3.14c	14 10 0	1.76c	1,000	1.75c	855	2.20c	10 0 0
Tin plate, base box 108 pounds	$ 4.85	1 0 0	.....	...	.....	...	$ 6.55	1 7 0
Domestic Prices at Works or Furnace—Last Reported								Renten Marks
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$16.01	3 6 0	$13.42	345(2)	$14.88	330	$19.55	85
Basic pig iron	15.76	3 5 0	13.42	345(1)	14.43	320	$20.24	88
Furnace coke	3.03	0 12 6	5.56	143	5.64	125	5.52	24
Billets	26.68	5 10 0	17.12	440	20.97	465	27.37	119
Standard rails	1.73c	8 0 0	1.00c	565	1.18c	575	1.48c	142
Merchant bars	1.62c	7 10 0	1.00c	545	1.20c	585	1.36c	130
Shapes	1.49c	6 15 0	1.00c	520	1.15c	560	1.38c	132
Plates, ship, bridge and tank	1.60c	7 7 6	1.20c	680	1.37c	670	1.50c	144
Sheets, black, 24 gage	2.27c	10 10 0	2.08c	1,180	2.26c	1,100	2.35c	225
Sheets, galvanized, 24 gage, corrugated	3.60c	16 12 6	2.99c	1,700	4.61c	2,250	3.65c	350
Plain wire	2.38c	11 0 0	1.67c	950	1.74c	850	1.56c	150
Bands and Strips	2.22c	10 5 0	1.29c	735	1.49c	725	1.64c	157

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.15) f. o. b. Ferromanganese £15 5s 0d ($73.96) f. o. b. German ferromanganese £14 0s 0d ($67.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg and German are for basic bessemer steel.

Machinery

Tool Auction Develops High Prices—Buying of Equipment Remains in Steady Volume—Crane Market More Active

ONE of the best indications of the demand for machine tools is the high prices obtained at the auction at the Midwest Engine Co., Indianapolis, last week. Prices paid for some of the machines represented two-thirds of present prices of the same tools. As a result dealers in used equipment did not figure in the buying as heavily as usual. Part of the equipment went directly to consumers. Several milling machines were purchased by the Chrysler Motor Car Co. Higher prices recently announced apparently have had little effect on sales. In several instances customers who failed to take action on former quotations, are placing orders at the new levels. Deliveries are being delayed still further.

New York, Nov. 24.—Although devoid of large lists, machine tool buying continues fairly brisk. Action by several New England railroads including New York, New Haven & Hartford, Boston & Maine, Boston & Albany and Maine Central, is awaiting approval of budgets. It is likely no action will come on these lists before late December. Current orders include two milling machines for the Bloomfield, N. J., plant of General Electric Co., and one for the Plainfield, N. J., plant of International Motors Co. Both orders went to a Cincinnati builder. Brooklyn-Manhattan Transit Co. has closed on a 1100-pound steam hammer for its DeKalb avenue shops and Missouri-Pacific on a similar tool. These machines, along with a 24-inch crank slotter for Ford Motor Co., Detroit, went to Niles-Bement-Pond Co. Maine Central has purchased a tube cutting machine. One of the larger orders is that of a high school in Paterson, N. J., for a radial drill, shaper, lathe, and grinder with one seller, two lathes with another and three lathes and a grinder with still another. Considerable woodworking machinery also was placed, the great bulk going to one seller. In the way of inquiries, Argus Radio Corp., New York, will buy a high speed riveting hammer and a heavy duty shaper. Crane buying is the slowest for many weeks, this applying to overhead as well as locomotive cranes.

Boston, Nov. 24.—Improved activity is reported in the New England machine tool market. The district has lagged behind other parts of the country in its local buying, but now is starting to catch up. It is encouraging that many sales represent the textile industry which for months has shown but little activity. Textile machine makers have been buying more generously than in several weeks. Tool manufacturers continue to receive a large volume of orders, and many departments are operating on overtime schedules. Used tool sales have been subdued by overstocking.

Pittsburgh, Nov. 24.—Equipment sellers report the usual "end of the year" quietness is on, except for occasional sales of machine tools. After that date some sales will be made on invoices dated Jan. 2, 1926, others holding off until after the holidays. Meantime, a few straggling sales are noted of smaller types of equipment such as grinders and small lathes. Westinghouse Electric & Mfg. Co. continues to purchase against recent lists. R. D. Nuttall Co., Pittsburgh, is expected to buy a horizontal boring mill, two drill presses and special machines. J. F. Gaughn, Warren, Pa., is in the market for a cylinder boring machine and lathe. Many telephone inquiries are coming out now simply for estimating purposes covering 1926 improvements. Crane sales are few with details withheld on a number of new inquiries.

Cincinnati, Nov. 24.—Machine tool business here is quiet, but a number of large inquiries are expected to develop into orders before the year ends. Large orders have been scarce in this market the past month. However, individual sales have been heavy and the November average will compare favorably with previous months. The Cincinnati board of education will be in the market shortly for a list of manual training equipment for the new Western Hills high school. G. A. Gray Co., has moved into its new plant in Evanston and will sell its old structure.

Chicago, Nov. 24.—Advancing prices and further delivery delays describe the machinery market here. Nash Motors Co. has placed a number of manufacturing drills for its Milwaukee plant. Youngstown Sheet & Tube Co. is inquiring for a slotter, a wheel press and seven drills. J. H. Krause Supply Co., Rockford, Ill., is inquiring for a 2-inch and 6-inch heavy duty pipe machine. Chicago machinery dealers were heavy buyers at the sale of Midwest Engine Co. equipment at Indianapolis. The high prices bid for this equipment reflect the strong feeling in this market. A 3½-foot radial drill, 6 years old, brought $1500, compared with the present quotation of $2250. Two 6-year old horizontal boring mills were knocked down for $2550 each, or $1300 under the new price. A No. 5 milling machine went for $3650, a 4-foot radial drill for $2650 and a 26-inch turret lathe for $2400.

Cleveland, Nov. 24.—Sales continue good although inquiries are more scarce. Price advances are in effect on some lines of equipment, nevertheless, old inquiries are being turned into sales at the new levels. Eaton Axle & Spring Co., Cleveland, has closed on additional equipment, one order for about 100 machines consisting largely of multiple-spindle sensitive drills, going to a local dealer. With considerable used equipment already purchased, this company's needs are believed satisfied. March 15 deliveries now are quoted on grinders and milling machines. Wadsworth Salt Co., Wadsworth, O., is in the market for a milling machine, lathe, planer and other equipment for a machine shop. Snyder Sales Co., Columbus, O., wants a drill press and automatic machine.

CRANE ORDERS PLACED

10-ton and 5-ton electric cranes for Heintz Mfg. Co., Philadelphia, to Alfred Box & Co.

Single awards include: 75-ton electric crane for Consolidated Gas, Electric Light & Power Co., Baltimore, to Whiting Corp.; 20-ton crane for Realty Development Corp., 111 Broadway, for Jackman hydroelectric development, Hillsboro, N. H., to Alfred Box & Co., through Baughman Engineers, Boston; 10-ton electric crane for Colonial Slate Co., Wind Gap, Pa., to Alfred Box & Co.; 10-ton crane for American Fabricated Steel Co., Philadelphia, to Alfred Box & Co.; 7½-ton handpower crane for American Spiral Pipe Co., Chicago, to Alfred Box & Co.; 5-ton handpower crane for Gulf States Utilities Co., Beaumont, Texas, to Alfred Box & Co.; 5-ton overhead traveling crane for South San Joquin Irrigation district, Manteca, Calif., to Cyclops Iron Works; 5-ton crane for International Petroleum Co., Toronto, Ont., to Alfred Box & Co.; 3-ton handpower crane for Cliffside Iron Works, Cliffside, N. J., to Alfred Box & Co.; 2-ton crane for Crescent Ice Co., Philadelphia, to Alfred Box & Co.; 2-ton crane for Clifton Ice Co., Philadelphia, to Alfred Box & Co.; 1-ton transfer crane for Samuel J. Creswell Iron Co., Philadelphia, to Alfred Box & Co.

CRANE ORDERS PENDING

Locomotive cranes for Wiggins Terminals, Inc., Charlestown, P. O. Boston, Mass.

Single inquiries include: 15-ton overhead electric crane for U. S. Cast Iron Pipe & Foundry Co., Scottdale, Pa.; 5-ton hammerhead electric crane for Port of Port Angeles, Wash., bids opened Dec. 9; overhead electric crane for proposed stainless steel plant of Latrobe Electric Steel Co., Latrobe, Pa.

In a recently published report of the first meeting of the New England shippers advisory board held at Hartford, Conn., the statement was made that southern New England is the most intensive manufacturing area in the world. Over 400 attended the board meeting.

Steel Plate Fabrication Gains in October

Washington, Nov. 24.—Production of fabricated steel plate in October totaled 27,558 tons compared with 23,985 tons in September, according to returns to the department of commerce from 36 companies. The largest individual gain was recorded in blast furnace plates, this increasing from 427 to 2500 tons in the September-October period. Further comparisons follow:

	Total	Oil storage tanks	Gas holders	Blast furnaces	Stacks and miscellaneous
1923	538,156	296,128	43,876	9,730	141,258
1924	312,716	122,360	43,747	12,426	108,836
Oct.	23,749	7,758	1,660	2,252	10,087
Total (10 mos.)	229,397	84,136	32,648	9,600	89,311
Nov.	34,153	12,787	1,876	304	9,647
Dec.	49,559	26,445	9,223	2,697	9,088
1925—					
Jan.	27,064	4,314	6,529	4,495	9,276
Feb.	20,805	3,321	4,059	289	7,763
March	22,502	2,908	3,635	651	8,158
April	22,421	6,547	1,460	682	9,351
May	27,684	8,503	2,118	404	10,141
June	34,402	16,327	2,192	373	11,349
July	29,367	6,381	2,254	602	14,159
Aug.	26,210	7,500	3,671	1,240	11,826
Sept.**	23,985	8,458	1,510	427	11,500
Oct.*	27,558	8,076	1,432	2,500	12,621
Total (10 mos.)	261,988	72,335	28,860	11,663	106,144

*Data for one company estimated.
**Revised.

Auto Output in October Makes High Record

Washington, Nov. 24.—Production of passenger cars in the United States and Canada in October reached the highest figures in the history of the automobile industry, according to the monthly figures reported to the department of commerce. The aggregate number of cars turned out by the plants was 406,569, of which 392,648 were made in this country and 13,921 were produced in Canadian assembly and production plants of American makers. The best previous month was in April this year when 391,302 passenger cars and trucks were made in this country and Canada. Truck production in October was 45,823 against the peak for all time of 60,368 in September and 32,475 in October 1924. The following table shows the output in this country and Canada by months:

	Passenger Cars			
	1922 Total	1923 Total	1924 Total	1925 Total
Jan.	84,189	228,860	293,822	212,908
Feb.	112,755	260,320	343,444	252,785
March	157,839	327,038	357,006	332,151
April	202,567	351,622	346,355	391,802
May	238,462	358,646	286,266	382,714
June	268,501	343,985	225,034	364,806
July	228,456	303,497	244,503	358,554
Aug.	252,795	318,848	255,193	221,813
Sept.	190,867	302,340	263,468	272,413
Oct.	219,919	338,469	260,845	406,569
Nov.	217,953	288,810	204,316	
Dec.	210,692	279,862	182,028	
Total	2,384,995	3,702,297	3,262,280	3,196,067

	Trucks			
	1922 Total	1923 Total	1924 Total	1925 Total
Jan.	10,005	20,506	30,627	28,141
Feb.	13,853	23,283	32,756	34,410
March	20,631	36,619	36,270	45,098
April	23,429	39,641	37,766	47,822
May	24,880	45,677	35,112	43,303
June	26,962	42,453	28,884	38,054
July	22,507	31,703	26,227	41,773
Aug.	25,273	32,195	28,503	37,713
Sept.	19,905	29,626	31,829	60,368
Oct.	22,446	31,515	32,332	45,823
Nov.	22,522	29,166	27,766	
Dec.	20,911	28,862	27,324	
Total	253,324	391,246	375,426	422,587

Andrew Glass, Wheeling Steel Official Dies

Wheeling, W. Va., Nov. 24.—Andrew Glass, director, vice president and general manager of the Wheeling Steel Corp., died suddenly of heart attack Nov. 21, at the age of 45 years. With the exception of a period from 1922 to May, 1924, when due to illness he relinquished his duties, he had been in active charge of all operations of Wheeling Steel Corp. plants from the organization of the corporation in 1920 by consolidation of the LaBelle Iron Works, Wheeling Steel & Iron Co., and the Whitaker-Glessner Co.

Mr. Glass was born in Wheeling, received his education in Chicago schools, and held his first position at the age of 18 with the Chicago office of the Wheeling Corrugating Co. In 1909 he became resident manager of the Portsmouth Steel Co., which was known later as the Portsmouth, O., works of the Whitaker-Glessner Co., and subsequently the Wheeling Steel Corp. Under his direction these plants at Portsmouth virtually were rebuilt.

As general manager of the Portsmouth works during the War, Mr. Glass conducted noteworthy experiments for the government and won recognition for his company and for himself for distinguished success in development and production of materials for the ordnance and supply departments.

Mr. Glass was a nephew of Alexander Glass, chairman of the board of the Wheeling corporation, and came of a family of pioneers in the steel industry of the Ohio valley.

Building Wage Increase Demanded in New York

New York, Nov. 24.—A number of unions in the building trades have given notice of their intention of demanding higher wages when present schedules expire at the end of the year. It is estimated that granting the demands would place an additional burden upon building of approximately $84,000,000. Bricklayers and stone masons will demand a wage of $16 a day, an increase of $4 a day over the present scale, while the other crafts will demand increases ranging from $1.50 to $2. In general the new rates would establish a $12 daily wage for mechanical and $9 for helpers, which is estimated to amount to about 14 per cent over the 1925 wage schedules for the 120,000 men affected. The bricklayers, stone masons, carpenters, and several other crafts also will ask for a 5-day week.

Pig Iron Less Active; Prices Firm

(*Concluded from Page* 1358)

see iron. The largest recent sale was 3000 tons of northern foundry iron purchased by the Wehrle Co., Newark, O., for first quarter. Another melter in this district bought 1000 tons of ferrophosphorus, while another transaction involved 600 tons of northern iron. The Peerless Mfg. Co., Louisville, Ky., is inquiring for 1000 tons of southern iron.

St. Louis, Nov. 24.—The price situation in pig iron continues extremely strong, with demand good and offerings from all quarters smaller than in many months. The Midland Coke & Iron Corp., formerly the St. Louis Coke & Iron Co. has sold practically its entire output for first quarter, recent transactions totaling 30,000 to 35,000 tons. The larger portion represents basic iron, an east side melter being the principal purchaser. Southern producers have also sold heavily into the first quarter. Steady improvement is noted in the melt. The leading local blast furnace interest has advanced its asking price 50 cents to $23.50 to $24, f.o.b., Granite City. Northern iron also is 50 cents higher at $23 to $23.50. The lowest southern iron offered is on a basis of $21, Birmingham. Two of the leading producers in that section are firm at $22, furnace.

Birmingham, Ala., Nov. 23.—Virtually out of the market, Birmingham furnace interests now are selling only small tonnages. Spot sales have been made up to $23 for No. 2 foundry. The more general asking price now is $22, for first quarter. Two additional furnaces are in operation on foundry iron here. The local melt is heavy.

New York, Nov. 24.—Pig iron sales for the week total 7500 to 10.000 tons for this year and first quarter. The trade is relying mainly on foreign iron on new purchases. Domestic iron is scarce. New inquiries total 2000 to 3000 tons. Buffalo furnaces are charging 50 cents extra for No. 2X, plus $1 ti $1.50 for No. 1X. Eastern Pennsylvania iron is $23. base, furnace, plus 50 cents for No. 2X and an additional $1 for No. 1X. Virginia furnaces have sold 500 to 1000 tons at unchanged prices. Witherbee, Sherman & Co. will light their Port Henry furnace Nov. 28.

Buyers Give Testimony in Bethlehem Case

Washington, Nov. 24.—Hearing of testimony in the Bethlehem merger case was resumed in Baltimore yesterday. The federal trade commission is completing its evidence after which testimony will be submitted by the Bethlehem Steel Corp.

Among the witnesses called by the commission were Andrew J. Dietrich, steel jobber and fabricator; Albert G. Harkins, member of the Maryland Steel Products Co., Baltimore, and William G. Wetherall, iron and steel jobber and fabricator.

Mr. Dietrich stated his firm has been buying 12,000 to 15,000 tons of shapes annually within the last few years; from 1000 to 1500 tons of plates; 700 to 1000 tons of commercial steel bars; 4000 to 5000 tons of reinforcing bars, besides bolts, nuts and rivets. He stated that in his experience orders make the prices with all the mills. He also testified that his firm has bought some deformed bars, plain flats and some shapes from foreign producers in the last year or two, these coming from Belgium and Luxemburg.

Mr. Harkins testified that his concern buys 2000 to 2500 tons of shapes yearly; 150 to 250 tons of plates; about 2000 to 2500 tons of reinforcing bars, and merchant bars, bolts and rivets and other commodities.

Mr. Wetherall stated his firm buys about 1000 to 1500 tons of merchant bars yearly, and smaller quantities of shapes and plates, bands, spring steel bars, black and galvanized sheets and other materials. All of these witnesses testified as to what mills solicited their business in the Baltimore district prior to and after the Bethlehem acquisitions.

Sheet & Tube Celebrates 25th Anniversary

Youngstown, O., Nov. 24. — The Youngstown Sheet & Tube Co. celebrated the twenty-fifth anniversary of its incorporation on Nov. 21. James A. Campbell, organizer of the company and its president for 21 years, received many floral tributes and congratulatory messages.

In the 25 years Sheet & Tube has grown from a $600,000 concern to one of $250,000,000, the second largest independent in the country. The management of the company has been in the hands of Mr. Campbell 25 years. When the company was organized as the Youngstown Iron, Sheet & Tube Co., Mr. Campbell was vice president and general manager, four years later he succeeded George D. Wick as president. Of the original board of directors Robert Bentley still serves. He was secretary of the company 25 years ago. W. C. Reilly now vice president in charge of operations was auditor of the company 25 years ago.

Structural Steel Output Shows Good Gain

Washington, Nov. 24.—Fabricated structural steel bookings in October were estimated at 255,200 tons, according to reports to the department of commerce by 168 companies having 244,915 tons monthly capacity and reported summarily in the Nov. 19 issue of IRON TRADE REVIEW. Actual bookings of these companies totaled 215,486 tons, or 88 per cent of capacity. Shipments of 263,900 tons in October, were the highest since the department started compiling such data in January 1924. Computed tonnage booked for the first ten months of 1925 totaled 2,201,100 tons compared with 1,893,700 for the same period of 1924. Further comparisons follow:

	Actual tonnage booked	Per cent of capacity	Computed tonnage booked	Computed tonnage shipped
1924	1,003,856	....	1,148,400	1,139,700
Total (10 mos.	.....	....	1,893,700	2,003,900
Oct.	166,367	65	188,500	220,400
Nov.	213,247	83	240,700	185,600
Dec.	201,090	79	229,100	182,700
1925				
Jan.	147,079	57	165,300	171,100
Feb.	149,489	58	168,200	182,700
March	177,154	69	200,100	217,500
April	197,813	78	255,200	223,300
May	176,886	69	200,100	226,200
June	219,748	87	252,300	229,100
July	210,068	83	240,700	246,500
August	*199,618	80	232,000	237,800
Sept.	**201,766	80	232,000	237,800
October ..	215,486	88	255,200	263,900
Total (9 mos.)	1,884,106	....	2,201,100	2,235,900

*Reported by 190 companies with 251,070 tons capacity. **Reported by 187 companies with 251,965 tons capacity' ***Reported by 168 companies with 244,915 tons capacity.

Marietta Plant Starts

All departments of the works of the Pittsburgh Tin Plate & Steel Corp. at Marietta, O., started in full Nov. 23. Two hot mills with full crews resumed last Wednesday but the two other hot mills and the other departments went on in full this week. Reorganization and re-financing of the company has been accomplished by citizens of Marietta, and under the direction of A. V. Somers, general manager, tin plate now is being produced for the general trade. Steam-power has been replaced by electricity throughout the rolling mills. The plant has not been in operation for many years.

Estimates Ore Reserves as 75 Years' Supply

A study of iron ore in the Superior district by Prof. U. S. Grant, head of the geology department, Northwestern university, indicates reserves sufficient for 75 years or more.

"The most reliable estimates which have been made of the reserves are those adopted by the state tax commissions," declares Professor Grant. "These figures, for 1923, gave a total known ore reserve for that region in the United States of 1,503,000,000 gross tons. At an average annual production of 80,000,000 tons these reserves would last for 30 years. But as the annual production is likely to increase it is probable that 25 years would be nearer the truth.

"These estimates are very conservative and may be looked upon as showing the minimum reserves. To such estimates should be added a large amount of ore from the different ranges which has not yet been definitely proved but which is known with reasonable certainty. Estimates made by men well qualified to do so show that these additional reserves are nearly equal to the definite reserves given above. These would add approximately another 25 years to the life of these reserves.

"It would seem reasonable to expect that there are still possible and even probable reserves which may last for another 25 years; so the outlook for the Chicago area seems to be favorable for an iron ore supply lasting 75 years beyond the present. Beyond that one does not care to go now, but the possibility of a future larger than 75 years is reasonable."

Plan Inspection Trips

A feature of the annual meeting of the American Society of Mechanical Engineers to be held in New York, Nov. 30-Dec. 4 will be an all-day excursion to the plant of the Bethlehem Steel Co., Bethlehem, Pa., Friday, Dec. 4. Other excursions to the De La Vergne Machine Co. and Hell Gate power station, Tuesday, Dec. 1; New York-New Jersey vehicular tunnel, Wednesday morning, Dec. 2; and Hudson avenue power station, Wednesday afternoon. A demonstration will be given Thursday of the 100-ton oil-electric locomotive of the Long Island railroad, with an alternative trip planned to the Steinway & Sons piano factory. That afternoon an inspection party will visit the Edison Lighting institute at Harrison, N. J., Worthington Pump & Machinery Corp. and the Harrison gas works.

Join Forces for State Economy

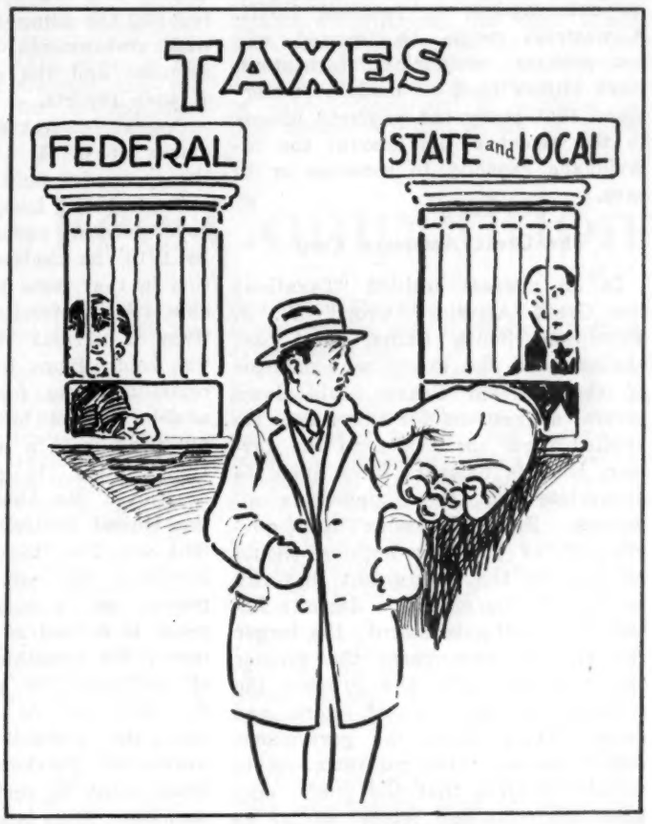
National Founders Association, Agricultural and Transportation Interests Discuss Tax Problems—Want Local Expenditures Reduced—Apprentice Training and Personnel Work Receive Attention

MANUFACTURERS, farmers and transportation men joined forces last week in the inauguration of a nationwide drive for greater economy in state and local expenditures. This action was taken at a conference held under the auspices of the National Founders association at its twenty-ninth annual convention at the Hotel Astor, New York Nov. 18-19.

Virtually the entire first day's sessions were devoted to a discussion of the present taxation problems, while the afternoon of the second day was given over to the establishment of machinery for putting the conference's tax program in effect. The latter meeting was presided over by C. A. Dyer, president of the Lower Tax-Less Legislation league.

Apprenticeship training and personnel work received considerable attention at one session. Speeches were presented by L. A. Hartley, association director of education and by L. W. Olson, chairman of the committee on industrial education. This subject was also touched upon by A. E. McClintock, association commissioner, who in addition, reviewed conditions over the past year. Only one strike, he declared, was experienced by an association member and in this case but 20 employes were involved.

William H. Barr, Buffalo was re-elected president, while L. R. Clausen, J. I. Case Threshing Machine Co., Racine, Wis., was elected vice president to succeed F. B. McBrier, of the Erie Steam Shovel Co., Erie, Pa. J. M. Taylor, Chicago, and the Chicago Trust Co., were re-elected secretary and treasurer, respectively. A. E. McClintock, Chicago will continue as commissioner. The annual dinner was held Nov 18.



A cartoon issued in the interest of a better understanding of the federal and local tax situation

Taxation Considered Leading Business Issue

OUTLINING the purpose of the conference, President Barr, in his annual address, made stirring appeal for rational and scientific taxation. The federal government, he declared, has given an admirable lesson in the enforcement of economy in national expenditures. Without this reduction there could be no reduction in federal taxes, and it is a similar economy, coupled with intelligent administration, that is needed in state and local affairs. The speaker believed that if the public generally could be educated to recognize the direct effect of taxation, what it means to the personal budget, little time would be wasted in slicing the enormous and unwarranted sums being spent by state and local government.

This thought was emphasized in an eloquent address by James A Emery, associated counsel. "Taxation," he declared, "is not a political or economic problem. It is not a class nor a group, nor a sectional nor a partisan issue. It is a business issue. No social group can meet the serious questions it represents nor secure the necessary safeguards which experience indicates by itself. Our interest as citizens is one. Our co-operation in the public interest is not merely a privilege but an obligation."

Mr. Emery stressed the need of immediate attention to this subject.

Field and Factory Interdependent

The speaker stressed the intimate interdependence existing between field and factory, and added that without transportation, neither could function with any degree of efficiency. He traced the effects of taxation. The speaker declared that 12 ½ per cent of the country's income was going into taxes, but asserted that this did not half tell the story. The country consumes practically 75 per cent of its production, Mr. Emery stated. This leaves a surplus of 25 per cent. It is the effect of taxation upon this surplus, which the country has for progress and upbuilding, that is the real story, the speaker declared, and as the situation now stands, almost half of this surplus is going into taxes.

"Taxation is unavoidable, like death, but it may be controlled like disease," the speaker stated. "We are the wealthiest of nations. We naturally contemplate expenditure proportionate to our wealth and our position in the society of mankind, but the economic system we have reared and the standards of life we have established demand the consumption of an in-

creasing amount of all we produce and the application of an ever larger amount of our surplus. We can endure generous expenditure, but we can afford neither public extravagance or waste."

Mr. Emery stated that it must be recognized, first of all, that the best preparation for controlling public extravagance is personal thrift. A wasteful people, he asserted, will not produce economical legislators. Each citizen must be made to understand that every tax payment lessens to the extent of its amount the individual's capacity to consume or to save.

The Great American Crop

In an address entitled "Taxation; the Great American Crop," W. J. Thompson, South China, Me., past chairman of the executive committee of the national Grange, laid down several suggestions for tax relief. He applied them specifically to the farmer, but his listeners were quick to appreciate that they applied to all groups. First: Have as little government as possible; nothing should be done by the government that can be done by its citizens. Second: Retain local self-government; the larger the unit of government the greater the cost and also the greater the tendency to increase the work and costs. Third: Keep the government out of business; put contracts out to suitable bidders that the public may know the costs and remove so far as possible the opportunity for graft. Fourth, and last: Pay as you go. Let us not load onto posterity a debt that properly belongs to us.

The speaker pointed out that the total cost of government in 1924 of approximately $10,000,000.00 more than exceeded the farm value of the chief crops of the United States in that year, which was about $9,500,000,000.

R. H. Aishton, president of the American Railway association, presented a graphic picture of the struggle the railroads are having with the taxation problem. He declared the railroads are paying a tax of almost $1,000,000,000 a day, a sum that has more than doubled in 10 years. With returns realized by the railroads under the level of rates determined by the interstate commerce commission materially below the standard of a fair return set up in the Transportation act of 1920, the burden has become increasingly hard to bear. Since 1921 railroad taxes of about $360,000,000 a year, have increased 30 per cent, while rates since that time have undergone reduction of 13 per cent. The speaker also referred to the multiplicity of the taxes levied upon the railroads. This, he declared, has led to confusion, duplication and many inequalities as between corporations and regions and has added another element to the cost of railroad operation in the expenditure required for the corporation's special reports, the filing of countless forms with governmental tax and other agencies and the cost of accounting of such reports.

Special interest centered in the remarks of C. A. Dyer, who outlined the successful fight in which he was a leader, for lower state and local governmental expenditures in Ohio. In 1919, he declared, the tax situation in that state had become intolerable. A conference of representatives of various leading industries was held. Plans were laid out and a committee was formed to draw up a debt control bill which later was put through as a law. This law, Mr. Dyer stated, is perhaps the most drastic of its kind ever enacted in the United States. Its chief provisions are, first, that no money can be borrowed for current operating expenses, and a current operating expense is defined as an expenditure of money for something that has a life of less than five years; second, that no bond can be issued for longer than the probable life of the improvement purchased and that all bonds must be serial and paid when due. Mr. Dyer added that since this co-operation among the tax paying interests of the state has gone into effect it has become increasingly easier for them to get together and accomplish the objectives sought.

Commissioner McClintock reported a more widespread interest among members in the training of apprentices, and laid particular stress upon the work being accomplished in the development of foremen. Foreman training, foremen clubs, and other get-together means are being used with effective results, he declared. He thought that more than ever before management is giving more thought to its duties and responsibilities, as well as its rights, and that out of it is growing a community of interest within the individual plant that is most wholesome.

Discussing business conditions, the commissioner stated that heavy work foundries, which have had dull business for the past four or five years, are beginning to experience an improvement in trade. In the instance of a number of plants the point has been reached where there are no more molders for heavy work available in their towns, and efforts in recruiting molders from other places have been discouraging. One large manufacturing foundry has adopted the policy of buying castings from outside shops, notwithstanding the fact that its own foundry is idle.

A feature of one session was an illustrated address by H. M. Lane, president H. M. Lane Co., Detroit. He discussed the relative merits of various methods and kinds of equipment, as they are applied to individual shops.

Figures were presented, covering receipts and disbursements of the Moulder's Union for the year ending Sept. 30. The income from dues was approximately $541,000 and disbursements, of which $269,000 was for management and other expenses, and $79,000 for strike benefits, amounted to $349,000. The gain for the year was approximately $192,000, which with the previous balance brought the total on hand up to around $655,000. Union membership last year was 28,000, as compared with 33,000 the year before and 35,000 two years ago.

Supports Tax Reduction

Three speakers not listed upon the program were given a round ovation. One was General Atterbury, president of the Pennsylvania railroad, who voiced his hearty support of the tax reduction movement and who paid special tribute to Mr. Barr, Walter Drew and James A. Emery as men who have done more than any other three men in the real advancement of the wage earner. Another unlisted speaker was R. W. Dunlap, assistant secretary of agriculture, while the third was Dr. David Jamieson, Toronto, Ont., who was present as personal representative of the premier of Canada, and who spoke of some of the major business problems of Canada and of the friendliness felt in the Dominion toward the United States.

Assistant Secretary Dunlap cited figures to show the burden now placed upon farmers by increases in state and local taxes over recent years. He urged rigid economy, and laid no small stress upon the importance of devising some efficient method of taxing intangible wealth. Farmers, he believed, suffered more from the ineffectiveness of the present method of taxing this wealth and from certain other tax inequalities than any other group.

A new warehouse recently was completed by the Keystone Steel & Wire Co., Peoria, Ill., which provided 42,000 square feet of floor space.

British Steel Outlook Decidedly Better

(*Concluded from Page* 1369)

British market is still keen, but the present level of British prices has acted as a check. Furthermore, several French mills are booked to such an extent that they have retired from the market. French offerings for plates have been made at £5 17s 6d ($28.50) for 3/16-inch plates and £6 7s ($30.75) for 1/8-inch plates.

In the rail market the French colonial office is inquiring of Germany for 2500 tons of standard rails and 2700 tons of accessories on the reparations account. John Cockerill in Belgium recently obtained a large orfor for Colombia, and Phoenix in Germany has been awarded 1000 tons of grooved rails for Japan. The German raw steel association continues to fix rebates on material destined to be worked up for export trade, ranging from 10 marks ($2.38) per metric ton for ingots to 22 marks ($5.25) for bars and 40 marks ($9.55) for pipe. An agreement has been reached between Belgian and German fire rod makers providing for a minimum price of £5 15s ($27.80) per ton for material sold in each other's territory. Negotiations as to the allotment of export markets are still under way.

German firms have received contracts from Bulgaria for bridge work, from Brazil for 67 locomotives, and from the Soviet government for lorries and machine tools. Considerable railroad material is to be ordered from Germany by Roumania on reparations account, and the Tube Union has received an order for 6000 tons of pipe from Argentina. Czecho-Slovakia is enjoying a certain amount of export trade and is working on pipe orders for Roumanian oil wells.

Belgian Steelmakers Feel Competition

BRUSSELS, Nov. 6.—(*European Staff Service*)—The Belgian iron and steel market is keenly feeling French competition, and as order books need refilling the tendency is toward easier prices. Germany also is appearing as a competitor, especially for medium sized sheets. The strike in the iron and steel works is still going on in the Charleroi district, but should these works resume operations this would tend to weaken prices further. The pig iron market maintains a certain firmness, the demand in the home market being fairly steady. Certain producers are booked up for some time ahead. Foundry pig iron 2.5 to 3 per cent silicon is quoted at about 325 francs ($14.70) per metric ton at the furnace. Export business is taken at the same price f. o. b. Antwerp.

Although demand for semifinished steel is more satisfactory than in the past, the market in this department in uncertain. A few Belgian mills have sold sheet bars at £4 11s ($22), but Lorraine mills are now offering at £4 9s ($21.50). The average quotation for basic bessemer billets is £4 8s ($21.25). Luxemburg prices are about on the same level with the Belgian.

The price asked for merchant bars by Belgian and Luxemburg mills averages £5 5s ($25.45) per metric ton, f.o.b. Antwerp, but business is transacted at £5 4s 6d ($25.25) and even £5 4s ($25.15) in order to meet French competition. The domestic price is about 585 francs ($26.50). Beams are easier and orders are scarce. The mills are trying in vain to maintain £4 18s ($23.75). In the home market beams are sold at 560 to 565 francs ($25.30 to $25.55). The price of rails is about 575 francs ($26) per metric ton. John Cockerill recently captured an important rail order for Colombia.

Wire rod mills are well occupied with domestic orders, and the price is firm at 625 francs ($28.25), while French and German rods are offered for export at about £5 13s ($27.45), f.o.b. Antwerp. An understanding has been reached between Belgian and German wire rod makers fixing a minimum price of £5 15s ($27.85) for material sold in each other's territory. Further negotiations are being pursued with a view to allotting export markets.

The plate and sheet market is depressed by scarcity of inquiries and the weakening influence of French and German prices. For 3/16-inch plate the Belgians still are quoting £5 17s 6d ($28.50), while French offers are as low as £5 15s 6d ($28). For ⅛-inch plates the Belgian quotation is £6 7s ($30.80) against the German price of £6 5s ($30.30). Belgian black sheets No. 24 gage are about £10 8s ($50.50), f. o. b. Antwerp. In the domestic market, 3/16-inch plates are about 670 francs ($30.35), No. 24 gage sheets are 1100 francs ($49.75) and galvanized sheets of the same gage are 2250 francs ($102).

The wire products department and the tube market are among the most satisfactory, both at home and for export. Wire nails are about £8 ($38.75), f. o. b. Antwerp, the domestic price being 900 francs ($40.55); bright wire is 850 francs ($38.45), and galvanized wire is 1125 francs ($51).

German Combines in Full Operation

BERLIN, Nov. 16.—(*European Staff Service*)—A great deal has been said about the organization of a Rheinische-Westphalian steel combination. The principal obstacle is the considerable tax which would have to be paid when the new company is formed. This tax would amount to from 40,000,000 to 50,000,000 marks ($9,500,000 to $12,000,000). However, it is hoped that by changing the denomination of the company a reduction of 50 per cent will be obtained on this government tax. In the meantime the negotiations are being carried on at Dusseldorf.

It has been announced from Berlin that the German railroads have ordered 450,000 tons of railroad stock from the raw steel union, to be delivered in monthly portions of 80,000 tons from now to the end of May. The pig iron syndicate has decided to maintain prices at the present level for November, while the raw steel union has fixed the rate of production of steel at 65 per cent for November. The other syndicates also have decided to maintain prices at their present levels for November. This includes semifinished products, rolled steel, plates and sheets. It is reported that the band and hoop union is now completed, the last outside concern having joined. It has been reported from Rome that the German railroads grant a substantial rebate in rates on iron and steel products being transported to coast ports for export.

A combine has been formed between the firm of Krupp and the Rheinische Metallwaren und Maschinenfabrik under the name of Rheinmetall-Krupp Lokomativenbau Gesellschaft. This action has been taken with the object of uniting the interest of the two firms in the manufacture of locomotives, and that each may avail itself of the other's experience.

The Vereins deutscher Eisen-und Stahlindustrieller has issued the following statistics giving the output of rolling mills in Germany during 1924 and the first half of 1925, in metric tons:

	1924	First half 1925
Semifinished products for sale	829,769	554,119
Railroad track material	1,052,858	735,869
Beams	460,500	403,852
Bars	2,321,235	1,554,798
Wire	908,669	570,764
Hoops and bands	281,891	228,791
Plates, 5-millimeter and over	766,940	503,369
Sheets, 3 to 5 millimeters	122,364	98,361
Sheets, 1 to 3 millimeters	236,628	178,399
Sheets, 0.32 to 1 millimeter	225,522	196,016
Sheets under 0.32 millimeters	24,196	15,664
Tinplates	86,488	48,934
Tubes	476,406	341,615
Railroad rolling stock	206,667	73,950
Forged products	128,482	95,426
Miscellaneous	45,705	33,870
Total	8,174,320	5,633,797

Steel Imports, Exports Increase

October Shipments Total but 141,817 Tons Compared with 136,754 Tons in September —Receipts Jump from 68,445 to 80,163 Tons in September-October Period—Imports of Iron Ore and Pig Iron Heavy

IMPORTS of iron and steel products into the United States in October, totaling 80,163 tons were the heaviest since June, according to data just compiled by the department of commerce. Exports for October increased to 141,817 tons from 136,754 tons in September. Total imports for the 10 months of 1925 amount to 765,187 tons, or a greater tonnage than has been imported since figures were first compiled in 1913. At the present rate of exports, those for the 10 months ending October, 1925, being 1,448,491 tons, the present year will be the smallest with two exceptions since before 1913.

IMPORTS AND EXPORTS
Gross Tons

	—1925—		—1924—	
	Imports	Exports	Imports	Exports
Jan.	77,065	141,714	26,677	249,126
Feb.	92,380	102,302	42,277	165,912
March	92,110	155,386	39,279	124,762
April	71,249	155,426	50,975	132,739
May	68,117	150,612	66,806	155,422
June	88,330	136,847	60,474	172,982
July	64,642	138,670	30,410	138,845
Aug.	68,489	188,963	44,928	138,670
Sept.	68,445	136,754	45,216	135,894
Oct.	80,163	141,817	40,877	158,553
Nov.	.....	.....	34,300	124,464
Dec.	.....	.....	69,281	129,465
Totals	765,187	1,448,491	556,281	1,805,064

Year	Imports	Exports
1923	734,734	2,009,141
1922	712,895	2,005,100
1921	135,825	2,150,276
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635

IMPORTS OF PIG IRON
(Gross tons)

	October		Ten months ended October	
	1925	1924	1925	1924
Belgium	1,172	.....	8,438	3,019
France	.....	95	8,314	23,208
Germany	3,351	2,050	62,302	9,728
Netherlands	1,906	147	39,838	20,948
Sweden	111	.....	1,803	700
England	13,948	1,100	68,396	39,135
Canada	308	130	5,364	14,975
Jamaica	.....	150	.....	.....
Dominican Republic	3	.....	3	.....
Honduras	.....	.....	.....	350
Straits Settlements	.....	.....	.....	500
British India	16,533	7,261	158,206	51,372
Kwangtung, leased terri.	277	30	516	30
British West Africa	.....	.....	100	.....
Scotland	.....	.....	.....	4,546
China	100	.....	100	2,375
Total	37,709	10,963	353,380	171,086

ORIGIN OF MANGANESE ORE IMPORTS
Gross Tons

Manganese ore from	—October— 1925	1924
Brazil	6,783	3,762
British West Africa	2,794	714
Russia in Europe	11,212	.....
Chile	1,130	.....
Canada	47	.....
British India	960	4,133
England	.....	342
Netherlands	.....	100
Totals	22,926	9,051

IMPORTS OF SCRAP AND RAILS BY COUNTRIES
October, 1925

From	Scrap	Rails
Germany	50	164
Sweden	30	.....
Canada	3962	49
Cuba	739	.....
Netherlands	.....	34
Belgium	.....	210
Other countries	26	.....
Total	4807	457

IRON AND STEEL EXPORTS
(Gross tons)

	October		Ten months ended October	
	1925	1924	1925	1924
Pig iron, not containing alloys.	2,874	3,373	25,718	37,456
Ferromanganese and spiegeleisen	49	....	4,150	3,145
Iron and steel scrap	10,329	1,773	72,514	89,121
Ingots, blooms, billets, sheet bars and skelp	6,845	14,018	61,795	82,673
Iron bars	244	273	4,121	4,516
Steel bars	8,704	9,036	91,090	87,687
Alloy steel bars.	229	244	3,082	2,191
Wire rods	1,587	1,531	17,777	15,957
Plates, iron and steel	7,971	7,996	83,527	76,183
Galvanized sheets	9,679	13,851	132,250	88,923
Black steel sheets	6,999	17,754	72,793	128,715
Black iron sheets	1,489	827	11,664	8,799
Hoops, bands and strip steel	3,200	1,582	32,876	20,317
Tin plate, terne plate, etc.	14,712	13,561	128,056	134,103
Structural shapes, plain.	13,796	8,081	82,452	86,539
Structural shapes fabricated	5,829	2,977	56,711	61,305
Metal lath	357	253	2,704	6,442
Steel rails	9,437	13,241	140,270	171,116
Rail fastenings, switches, frogs, etc.	2,275	3,659	31,831	32,451
Boiler tubes and welded pipe	13,527	14,894	193,730	151,091
Malleable iron screwed pipe fittings	712	668	7,384	9,619
Castironscrewed pipe fittings	496	1,127	6,153	6,626
Cast iron pressure pipe and fittings	3,205	1,261	13,561	11,593
Cast iron soil pipe and fittings	434	1,113	7,287	6,019
Plain wire	3,195	1,168	30,560	33,212
Barbed wire and woven wire fencing	6,148	9,638	59,355	76,473
Wire cloth and screening	170	100	1,497	1,470
Wire rope	263	278	3,649	3,741
Insulated wire and cable	33	35	568	876
Wire, n.e.s., and manufacturers of	493	1,264	7,030	9,790
Wire nails	1,041	903	7,778	19,930
Nails other than wire, including tacks	679	631	7,535	4,561
Horseshoes	50	103	592	864
Bolts, nuts, rivets and washers, excepting track	1,178	1,789	14,222	15,081
Car wheels and axles	2,125	2,318	17,377	18,877
Iron castings	1,047	687	9,141	7,382
Steel castings	294	492	3,831	5,170
Iron and steel forgings	122	168	1,860	1,345
Total	141,817	158,553	1,448,491	1,551,220

IRON ORE IMPORTS

	October		Ten months ending October	
	1925	1924	1925	1924
Algeria and Tunis	12,500	.....	.....	.....
Dominican Republic	11,000	.....	.....	.....
Chile	119,300	129,530	890,975	.....
Cuba	37,000	21,027	242,213	.....
Canada	1,032	636	3,413	.....
United Kingdom	460	.....	.....	.....
Germany	80	.....	.....	.....
Spain	8,045	9,880	56,736	.....
Sweden	6,987	31,461	261,355	.....
Switzerland	7,913	.....	.....	.....
Other countries	.....	8,241	36,472	.....
Totals	204,317	200,775	1,641,646	.....

IRON AND STEEL IMPORTS
(Gross tons)

	—October—		Ten months ended October	
	1925	1924	1925	1924
Pig iron	37,709	10,963	353,380	171,086
Ferromanganese, manganese metal and alloy	11,097	8,193	62,337	33,089
Ferrosilicon	129	415	4,066	8,696
Scrap	4,807	4,771	76,237	50,058
Steel ingots, blooms, billets and slabs	1,813	3,566	23,043	33,514
Steel bars	3,410	**	46,536	**
Iron bars	1,083	380	10,153	3,707
Structural shapes	7,374	4,792	68,658	34,233
Rails and splice bars	457	3,241	35,268	37,125
Boiler and other plates	232	7	642	3,253
Sheets, skelp and saw plates	210	426	2,995	2,414
Tin plate	66	55	266	987
Round iron and steel wire	334	105	3,357	2,922
Wire rope and insulated wire	104	156	1,798	13,310
Flat wire and strip steel	190	100	1,800	1,841
Wire rods	893	308	6,378	5,682
Tubular products	8,835	2,996	63,169	46,760
Nails and screws	1,205	14	2,358	390
Bolts, nuts, rivets and washers	21	5	100	137
Castings and forgings	194	384	2,646	2,531
Total	80,163	40,877	765,187	451,735

Survey Shows Michigan's Foundry Prestige

Detroit, Nov. 24.—Michigan is rapidly assuming a position of importance among the foundry states of the country. There are 228 gray iron foundries of all kinds in Michigan at present, according to a survey just completed here. About $50,000,000 is invested in these foundries. They include those which are part of the plants of automobile companies. They range in size from small shops which have six tons daily capacity to those which pour 50 to 75 tons a day.

Between 35,000 and 36,000 persons are employed throughout the year. More than 6500 tons of iron a day is now melted in the state and molded

into gray iron castings. It is conservatively estimated that 2,000,000 tons of pig iron, scrap and remelting material is used annually.

More than half of the gray iron casting is done in Detroit. The largest foundry in the world, the Rouge foundry of the Ford Motor Co. is located here. It covers over 30 acres of ground and pours more than 2000 tons of castings every 24 hours.

Favors Mileage Scale for Cast Iron Pipe

Washington, Nov. 24.—Finding freight rates on cast iron soil pipe shipped from Lansdale and Quakerstown, Pa., and other eastern points to southern territory unduly favoring cast iron pipe producers in the Birmingham, Ala., district. Examiner Burton Fuller in a tentative report recommends that the interstate commerce commission enter an order for a mileage scale based on distances.

At the same time Examiner Fuller also recommended this mileage scale for shipments of cast iron pipe from the plant of the Somerville Iron Works, at Chattanooga, to points east of the Mississippi river and north of the Ohio and Potomac rivers, including New England territory. The examiner also found these latter rates unduly preferential to the Birmingham producing points.

This mileage scale begins at $1.40 a net ton for 10 miles and under and includes shipments for a distance of 1225 miles and more than 1200 miles at a rate of $11.50. Complaints had been made by the Krupp Foundry Co. and also the Somerville Iron Works, and both cases thus were disposed of in the examiner's report. Producers of soil pipe at the various points in the Birmingham district intervened in opposition to the complaints and the Krupp company supported by cast iron pipe producers at Boyertown, Lenfield and Norristown, Pa., Bridgetown, and Hainesport, N. J., Chester and Brooklyn, N. Y., and at Baltimore.

Bethlehem Tells Story

A story of the properties and plants of the Bethlehem Steel Corp. has been told in booklet form by that corporation for distribution to stockholders. In 35 years the corporation has grown from one small plant at Bethlehem to the second largest producer of steel in the world. This growth and its impelling reasons are outlined in this publication. President E. G. Grace, in the foreword, calls attention to the great construction program, modernizing and developing the Lackawanna, Cambria and Midvale plants to afford economies in operation, and the addition of finishing capacity. Illustrations include views of all the properties of the company and maps indicate the location of its plants and raw material sources. A list of all products manufactured also is given.

DESTINATION OF EXPORTS FOR OCTOBER, 1925

	Bars	Scrap	Galvanized sheets	Black steel sheets	Plates not fabricated	Rails	Barbed Wire	Tin plate terne plate taggers tin
France	26	.....	.....	.....	112	.....	.....	.....
Netherlands	18	.....	.....	.....	.....	.....	.....	.....
United Kingdom	608	31	.....	.....	.....	.....	.....	.....
Canada	5,680	4,447	1,738	3,280	7,252	2,831	242	1,865
Panama	221	.....	.....	.....	.....	.....	.....	.....
Cuba	500	.....	1,169	32	106	262	496	69
Argentina	119	.....	541	82	.....	.....	1,282	871
Chile	312	.....	.....	.....	.....	872	.....	.....
Australia	156	.....	242	.....	.....	.....	243	.....
British South Africa	167	.....	150	.....	.....	.....	674	.....
Italy	.....	1,565	.....	.....	.....	.....	.....	.....
Spain	.....	3,194	.....	.....	.....	.....	.....	.....
China	.....	384	357	2	8	.....	.....	1,342
Hongkong	.....	25	.....	.....	.....	.....	.....	55
Japan	.....	627	537	2,092	.....	3,249	.....	4,586
Phillipine Islands	.....	56	907	.....	.....	209	389	350
Other Europe	.....	.....	733	.....	.....	.....	.....	.....
Norway	.....	.....	75	.....	.....	.....	.....	.....
Central America	.....	.....	365	.....	21	.....	316	.....
Mexico	.....	.....	695	126	37	399	358	389
Brazil	.....	.....	410	19	.....	.....	569	50
Chile	.....	.....	62	.....	.....	.....	24	389
Colombia	.....	.....	503	.....	.....	243	659	10
Other South America	.....	.....	536	138	.....	870	257	.....
Europe	.....	.....	.....	909	.....	.....	.....	.....
South America	.....	.....	.....	.....	167	.....	.....	.....
Honduras	.....	.....	.....	.....	.....	132	.....	.....
Venezuela	.....	.....	.....	.....	.....	.....	169	119
British India	.....	.....	.....	.....	.....	.....	.....	3,475
Peru	.....	.....	.....	.....	.....	.....	.....	14
Uruguay	.....	.....	.....	.....	.....	.....	.....	437
Other countries	897	.....	659	319	232	370	329	691
Total	8,704	10,329	9,679	6,999	7,935	9,437	5,907	14,712

Want Furnaces

To Make More Pig Iron in Philadelphia District

Philadelphia, Nov. 24.—Increasing imports of pig iron, with an indicated total of 255,000 tons for eastern seaboard cities in 1925, are leading American industrial interests to contemplate the extension of pig iron production facilities for this and adjacent districts.

The subject was discussed recently by members of the Philadelphia Foundrymen's association, and the opportunities for blast furnaces along the Delaware river was pointed out. At present only one company is making pig iron in the Philadelphia district, the capacity being 350 to 550 tons a day, while the daily consumption of pig iron in the district is estimated to be 5000 tons. High freight rates from other producing districts are giving foreign pig iron makers practically a monopoly on the business here. The foundrymen believe that with iron ore imported from Cuba, pig iron could be made by furnaces on the Delaware river and sold below the price of European iron, thus stimulating manufacturing enterprise. The assembly costs of iron manufacturers in the Philadelphia district are about $12 a ton. The loss of revenue to the railroads through the importations of pig iron is estimated at $5,000,000 annually.

Following the discussion of the subject at the meeting of the foundrymen, the president of the association, C. R. Spare, Walter Wood, chairman of the executive committee, and Howard Evans, secretary, are formulating plans, showing what the market offers, and the advantages for building a furnace plant.

"It is a situation that demands the attention of the steel industry, in this country now more than ever before," said Mr. Evans, "and it will not be alleviated until the demand for pig iron in the exporting countries becomes greater, or until freight and shipping rates increase so much that it would not be profitable to send the goods here for consumption.

"An example of the cheapness with which pig iron could be manufactured here lies in the result of the situation in Sparrows Point, Md., where the Bethlehem Steel Co. has manufactured pig iron on an extensive scale, with the result to them that steel at that point can be made for $2 less per ton than that manufactured in either Bethlehem, Pa., or Steelton, Pa. This, of course, is accountable in the fact that after the ore used in the manufacture of pig iron is landed in this country, freight charges constantly mount up when it is sent to the interior and then to its ultimate destination."

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

BETHLEHEM STEEL CO., has placed an order with Joseph T. Ryerson & Son Inc., Chicago, for 124 steel frame nail machines and 16 barbed wire machines for installation in the new plant at Sparrows Point, Md. The order includes five sizes of nail machines with capacity of 225 to 550 nails per minute and average production of the entire battery is 47,975 nails per minute. Each of the barbed wire machines will produce 1000 tons of wire per month.

* * *

UNION DRAWN STEEL CO., Beaver Falls, Pa., is erecting rough steel stock houses at its plants at Massillon, O., and Hartford, Conn., to be completed by the first of the year.

* * *

BLACK HARDWARE CO., Galveston, Tex., is enlarging its fabricating and warehouse facilities on the properties of the Galveston Wharf Co., a recent increase in capital providing for the larger plant.

* * *

C. G. SPRING & BUMPER CO., Cleveland, has re-elected directors and officers. Christian Girl continues as president, Charles Getler vice president, Fred S. Cornell vice president and secretary and M. D. Harrison treasurer.

* * *

THOMAS F. GARVAN, president of the Minerva Motors Co. of America, has recently acquired the controlling stock in the Remington-Burnelli Aircraft Corp., and it is understood that a new factory will be located near Brainard Field, Conn.

* * *

TERMINAL OIL & REFINING CO., Houston, Tex., has given a contract to the Graver Corp., East Chicago, Ind., for a 1000-barrel per day cracking process unit for installation at its refinery at Texas City, Tex. It will be designed for treating mid-coastal oils.

* * *

WORTHINGTON PUMP & MACHINERY CO., Cincinnati, O., has awarded a contract to the H. K. Ferguson Co., Cleveland, for an addition to its plant, 115 x 140 feet with 20-ton, five-ton and two-ton cranes and runways. It will be one, two and three stories.

* * *

PECK, STOW & WILCOX, Southington, Conn., has decided to move the equipment and business of the D. H. Stoll Co., Buffalo, N. Y., to its plant at Southington and is building an addition 55 x 150 feet to accommodate it. Since the purchase of the Stoll Co. if has been decided to consolidate production at Southington.

* * *

GRAIN KING MFG. CO., Minnesota Transfer, Minn., formerly the Anderson Implement Co., has bought from the Niles & Scott Co., LaPorte, Ind., full machinery equipment for the manufacture of steel wheels for its implement output. This equips the company for the entire production of its implements.

* * *

EDGAR O. STAMM, vice president and secretary of the Buckeye Products Co., Cincinnati, foundry equipment manufacturer, has disposed of his interest in the company to Charles J. Goehringer, president of the company. Mr. Stamm, at present, is interested in the manufacture and sale of machinery and equipment for paint and varnish manufacturers.

* * *

WEATHERLY FOUNDRY & MFG. CO., Shenandoah, Pa., has bought the pattern equipment materials, foundry and machine shop supplies of the Hazelton Iron Works and will move it to its own plant. The latter company has been in existence for 50 years but has been hampered in its expansion by being hemmed in by railroads. The purchaser will add colliery work to its line, this being the specialty of the older concern.

* * *

PURCHASE of the Algoma Power Co., Sault Ste. Marie, Ont., by the Insull interests at Chicago, will result in large power development in the Michipicoten district. The plant is at Michipicoten Falls, Ont., and develops 2000 horse power. This will be increased to 25,000 horse power by a new plant. The present head of 128 feet will be increased to 160 feet and water will be conserved by a series of control dams.

* * *

WEIRTON STEEL CO., Weirton, W. Va., has given a contract to the Dravo Contracting Co. for a harbor and docks and work is under way. The harbor which is being dredged, will be 1100 feet long, 105 to 145 feet wide and 14 feet deep. The unloading dock will be 400 feet long with an unloading tower with capacity for 400 tons per hour. Coal will be taken from this tower to coke ovens on a conveyor belt 700 feet long. The docks will require 150 tons of concrete bars and 11,000 cubic yards of concrete.

* * *

THERE is no foundation for the reports that the Youngstown Sheet & Tube Co. and the National Tube Co. have arranged with the United States Cast Iron Pipe & Foundry Co. and the Centrifugal Pipe Corp. for the production of steel pipe by the de Lavaud centrifugal process. In fact, there have been no negotiations whatever between the companies named. The rumor appears to have originated in London in connection with the announcement that John Brown & Co., Ltd., Sheffield, England, had arranged to use the de Lavaud process in making seamless steel tubes and hollow ingots.

* * *

FOLLOWING action at a recent meeting of stockholders of the Stowell Co., South Milwaukee, Wis., the assets have been placed in the hands of a committee of trustees consisting of Fred L. Sivyer of the Northwestern Malleable Iron Co., Milwaukee, F. W. Rogers of the South Milwaukee bank, and Thomas H. Spence, of Quarles, Spence & Quarles, attorneys, Milwaukee. It is stated the company is solvent and can pay its indebtedness in full. However, material losses were sustained during the past two years and it was decided to make an assignment, liquidate the business for the benefit of creditors and distribute the remainder realized among stockholders. Contracts will be completed by the operation of the plant under supervision of the trustees.

St. Louis Company Sold and Reorganized

St. Louis, Nov. 24.—Reorganization of the St. Louis Coke & Iron Co. has been effected, a new company, the Midland Coke & Iron Corp., having purchased the property at Granite City, Ill., at receiver's sale. The board of directors is composed of John Henry Hammond of Brown Bros., New York; Alfred J. Kieckhefer, president, National Enameling & Stamping Co., C. D. Marshall, president, the Riter-Conley Co.; Breckinridge Jones, chairman of the board, Mississippi Valley Trust Co.; Leonard A. Busby, president, Chicago City Railway Co.; Clement Studebaker, president, Illinois Light & Power Co.; F. J. Lewis, James Duncan, George W. Buckingham and W. G. Maguire.

The new officers chosen are: Leonard A. Busby, chairman of the board; W. G. Maguire, president; D. M. Curran, vice president; Andrew Mann, treasurer; P. D. Nelson, secretary; George W. Buckingham, counsel.

Construction of extensive additions and improvements are under way. Building of another blast furnace of 500-ton daily capacity and a power house are the features of the changes.

The blast furnace stack is under construction and is expected to be making iron by July. The Riter-Conley Co. has the general contract and is buying all the equipment. The stack will be practically a duplicate of that built recently for the Trumbull-Cliffs Furnace Co., except that the bosh will be 19 feet and the entire furnace slightly larger. The blowing engines will be built by the Ingersoll-Rand Co. and the turbo-generators by the Allis Chalmers Mfg. Co.

Railroads Reject Eastman Rate Scale

Washington, Nov. 24.—According to present indications railroads and shippers will not show any willingness to co-operate in the recommendations of the interstate commerce commission to put in effect the Eastman scale of freight rates in the South. It has been reported traffic officials of southern railroads will not submit to the new rates unless the courts compel them to do so.

The new rates were to become effective by Jan. 1, but no hope is seen now that the order thus can be carried out.

That none of the co-operation for which the commission had asked would be forthcoming is indicated by these communications. Trunk line and New England carriers allowed it to be known that they could not fall in line with the commission's proposed rates. They rejected the proposals as flatly as did the southern carriers because they said it would be impossible to comply with the commission's southern rate structure ideas.

Rejection of the commission's plan by the railroads was not accompanied by suggestions as to what should be done, as radical as the changes proposed by the Southern Traffic league. It rejected the proposal on the ground that the scale was too high, and the league condemned the principle running throughout the report, that rates in the South should be higher than in Official Classification territory. It favored intra-territorial rates, to be used by the southern distributors, no higher than charges available to shippers outside of the South into that territory.

Obituaries

JOSIAH FRANCIS JOHNSON, manager, general engineering division of the South Philadelphia Works of the Westinghouse Electric & Mfg. Co., died in the Chester hospital on Nov. 12. Death was caused by cerebral hemorrhage. Mr. Johnson was born July 15, 1879 at Ziongrove, Pa. Following primary education he spent some time as a railroad telegraph operator, and at another period taught school. He was graduated in 1905 from Pennsylvania State college. Mr. Johnson then joined the Westinghouse company and until 1906 was engaged in the shop testing of steam turbines. In 1910 he was field engineer and engaged in the erection, inspection and repair of steam power machinery. From 1910 until 1912 he was assistant district engineer with offices in New York, and district engineer of the Rocky Mountain district with offices at Denver. He was recalled to the East Pittsburgh plant, where in 1912 he became first assistant engineer of the steam turbine department, and later engineer of that department, which position he held until 1923, when he was made manager of the general engineering division.

* * *

George D. Roper, 70, head of the Roper Corp., Rockford, Ill., manufacturer of gas stoves, and operator of foundries under the name of the George D. Roper Co., died there Nov. 17. He was prominent in industrial and civic developments of his community.

* * *

Oliver Dyer Colvin, widely known Pacific Coast traction and power company executive and veteran railroad man, died at his home in Seattle, recently. Mr. Colvin was identified with some of the early railroads and street car enterprises in this state. More recently he was an active executive of the Seattle Car & Foundry Co., now the Pacific Car & Foundry Co. Illness forced him to retire from active management of this company five years ago.

* * *

George I. Onions, 65 years old, treasurer of the Great Lakes Pressed Steel Co., and president of the Ajax Plating & Specialty Mfg. Co., Buffalo, died Nov. 20 at his home there. He came to this country from England when a child, and entered the electroplating business in Buffalo in 1895.

* * *

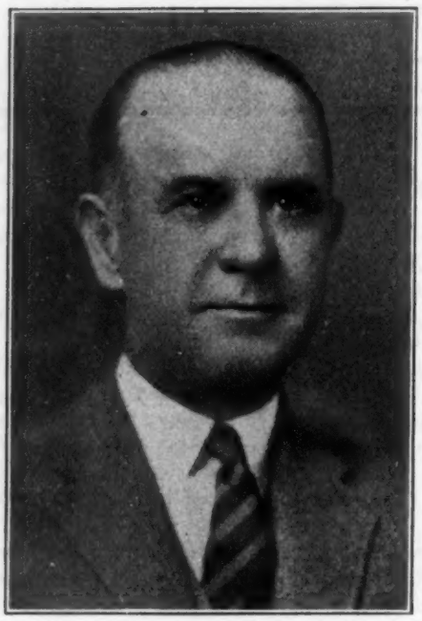
R. D. Reed, a member of the General Electric Co.'s industrial department and in charge of the sale of electric arc welding equipment; Mark A. Atuesta and Arthur W. Gross, members of the manufacturing department, and John C. Horstman of the manager's staff at the Schenectady plant, were killed in a train wreck Nov. 12 near Plainsboro, N. J. They had met in Baltimore in connection with the inter-works welding committee of the General Electric Co. and were en route to the Bloomfield plant when the accident occurred.

* * *

William Berlean Rodgers, aged 76, president and director of the Rodgers Sand Co., Pittsburgh, advocate of improved waterways, died at his country home near Pittsburgh, Nov. 16, after a short illness. Although Captain Rodgers was best known as a riverman, he was from time to time engaged in coal mining, manufacturing, land development and banking. He was born Feb. 27, 1851 at Franklin, Pa. In 1899 his extensive coal interests were merged in the Monongahela River Consolidated Coal Co. In 1900 the Rodgers Sand Co. was organized with Captain Rodgers as president. Captain Rodgers was a member of the Engineers Society of Western Pennsylvania and other clubs.

Industrial Men in the Day's News

Charles L. Wood, New General Sales Manager of Carnegie Steel Co.



WIDE experience in sales of steel forms a broad background for his new responsibilities.

RAPID advancement as a sales executive has followed competent fulfillment of various posts of duty.

CIVIC improvement is one of his greatest interests and he now is president of his city council.

BROAD background in the sale of iron and steel, and long experience in the distribution of those products have contributed to the advancement of Charles L. Wood to the position of general sales manager of the Carnegie Steel Co., announcement of which has just been made. He succeeds William G. Clyde, advanced to the presidency Oct. 31. Mr. Wood has been assistant general manager of sales in charge of the bar, hoop and band business of the Carnegie company since 1918. At that time he succeeded Mr. Clyde, when the latter was promoted to the office of first vice president and also general manager of sales.

Mr. Wood has had a wide experience in the steel industry extending over a long period. He was born in Youngstown, O., Sept. 11, 1873, and attended the public schools of that city. He then entered the Ohio State university, taking up a course of mining engineering in the class of 1896. His entrance into the industrial field was in the capacity of chemist with the Calumet Furnace Co. in Chicago. Business troubles forced this company to suspend operations, and then Mr. Wood turned his energies toward mining engineering in Colorado and other western districts.

In 1898 he became affiliated with the American Steel Hoop Co. and was made manager of the order department when the company moved to New York. Upon its consolidation with the Carnegie Steel Co. and with the formation of the United States Steel Corp., Mr. Wood was transferred to the sales department of the Carnegie company. A thorough knowledge of the bar and hoop business gained for him the appointment as assistant to Mr. Clyde when the latter became assistant general manager of sales in that department. Mr. Wood has consistently moved forward to higher positions. He, as one of the younger sales executives, has enjoyed a wide acquaintance throughout the steel trade. His promotion is accepted as a logical recognition of his special ability and well-grounded experience.

Mr. Wood is a thirty-second degree Mason, and always has found time for constructive efforts in other activities. In his home community of Thornburg, Pa., he is president of the borough council; is a director of the Duquesne club, vice president of the Chartiers Heights Country club, member of the Oakmont Country club, the Youngstown club, and the Fellows club of Pittsburgh. Mr. Wood served four years on the school board of his community and has been president of the borough council for five years. He is a member of the American Iron and Steel institute.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

SAMUEL R. HOOVER has been appointed assistant general sales manager of the Carnegie Steel Co. to succeed Charles L. Wood whose business career is sketched on page 1380 of this issue of IRON TRADE REVIEW. Mr. Hoover was born in Youngstown, O., Sept. 14, 1877. He attended the public schools there and later taught school in that community for three years. He first entered the iron and steel business in 1898 with the Mahoning Valley Iron Co. at Youngstown. He was a mill worker and later became attached to the general offices of that company as an inspector. In 1899 he went to Cleveland as shipping clerk for the Lake Erie works of the Republic Iron & Steel Co. In November, 1900 he became identified with the American Steel Hoop Co. and came to the Carnegie Steel Co. upon the formation of the United States Steel Corp. Since 1918 he has been assistant to Mr. Wood.

* * *

Frank G. Riehl has been elected president of the Howe Scale Co., Rutland, Vt., to succeed Carl B. Hinsman, resigned.

* * *

R. F. Mann, just appointed purchasing agent for the Warner & Swasey Co., Cleveland, builder of machine tools, formerly had been in the engineering department for about ten years.

* * *

William H. Davey, president of the Mansfield Sheet & Tin Plate Co., Mansfield, O., has been elected chairman of the board of the Mansfield Savings & Trust Co., that city. He succeeds the late James E. Brown.

* * *

George G. Griest, has resigned as general manager of the plant of the Niles Tool Works Co., at Hamilton, O. Mr. Griest came to Hamilton in 1918 to take charge of the plant. His plans for the future are not known.

* * *

W. W. Deal has been appointed sales agent of the American Steel & Wire Co. at Philadelphia, succeeding the late Henry Rose. Mr. Deal has been with the American Steel & Wire Co. for 13 years. He first went through the fence department in the company's New York office, then through the bale-tie department and then through the electrical and wire rope department. In 1922 he went to Philadelphia as a salesman, later becoming assistant to Mr. Rose.

* * *

Irvin V. Shaw has been appointed sales manager of J. G. Miller & Co., Philadelphia, formerly Miller, Carson & Co., Inc. Mr. Shaw has been connected with J. G. Miller for several years in the pig iron, coal and coke business at DuBois, Pa.

* * *

R. L. Ehmann has been made district manager of the industrial department of the Superheater Co., New York, with offices at Pittsburgh.

John R. LeVally, former manager at Pittsburgh, has been assigned to special duties with headquarters in New York.

* * *

W. J. Sullivan, secretary to James A. Farrell, president of the United States Steel Corp. was taken suddenly ill at the Steel corporation offices at 71 Broadway, New York, Nov. 17. He was removed to a private hospital in Brooklyn and is expected to be away from his duties for about a month.

* * *

Clarence E. Reed, formerly president and general manager of the Reed Roller Bit Co., Houston, Tex., has become vice president of the Bridgeport Machine Co., Wichita, Kans., with supervision over the manufacture of rotary tools. Plans for a new rotary bit plant are now in the hands of Mr. Reed.

* * *

John W. White has been appointed general manager of the recently formed Westinghouse Electric Co. of Japan. He has started to the Orient to assume his new duties, sailing from Vancouver, Oct. 30 and arriving in Tokio on Nov. 11. Mr. White has been in the employ of the Westinghouse company for many years and was recently manager of the Westinghouse Electric International Co.'s branch office at Havana, Cuba.

* * *

J. H. Whiting has been elected chairman of the board of the Whiting Corp., Harvey, Ill., manufacturer of foundry equipment and other machinery. He formerly was president and treasurer. He is succeeded by Col. T. S. Hammond, formerly vice president and secretary. R. A. Pascoe succeeds Colonel Hammond as secretary. R. H. Bourne, vice president and sales manager of the Whiting Corp., succeeds Colonel Hammond as president of the Grindle Fuel Equipment Co., subsidiary of the Whiting Corp. N. S. Lawrence, vice president and assistant sales manager, becomes president of the Swenson Evaporator Co., another subsidiary.

* * *

I. Lamont Hughes, vice president of the Carnegie Steel Co., will transfer his offices from Youngstown to Pittsburgh Dec. 1. Mr. Hughes, who was made vice president about ten months ago came to Youngstown as general superintendent in 1920. He has been in the employ of the Steel corporation since 1905 starting at the Ohio works. Mr. Hughes will have jurisdiction over all plants in western Pennsylvania, the Shenango valley, the Youngstown district, the Ohio River valley and other parts of Ohio.

Louis N. McDonald, general superintendent with headquarters in Youngstown, is in charge of the Youngstown district.

* * *

William L. Abbott, chief operating engineer of the Commonwealth Edison Co., Chicago, has been elected president of the American Society of Mechanical Engineers. The election was by mail ballot and its results were announced Nov. 19. Mr. Abbott is regarded as an expert on the elimination of waste in coal production. He served as chairman of a committee of the American Engineering Council which conducted a nation-wide survey of coal storage.

Mr. Abbott is 54 years of age and a graduate of the University of Illinois. He is past president of the Western Society of Engineers and a Fellow of the American Institute of Electrical Engineers. Vice presidents of the American Society of Mechanical Engineers also elected by mail ballot are Prof. William T. Magruder of Ohio State university, Prof. Graham Christie of Johns Hopkins university, and Roy V. Wright, New York, editor of *Railway Age*, Erik Oberg has been elected treasurer of the society.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

FAYETTE, ALA.—Bagwell Machine Works, C. A. Bagwell president, is building an office structure and will use present office space for enlarged foundry and shop purposes.

ALAMEDA, CALIF.—Boyle Mfg. Co., 1918 Park street, is having plans made for a plant for production of steel household equipment.

BERKELEY, CALIF.—Mann Mfg. Co., 454 Golden Gate avenue, will build a 2-story machine shop 120 x 180 feet at Dwight Way and Ninth street.

LOS ANGELES—Baash-Ross Tool Co., 5520 Boyle avenue, is building a plant 98 x 200 feet on South Boyle avenue.

SAN FRANCISCO—R. J. O'Brien, Alexander building, is having plans made by Albert W. Burgren, 110 Sutter street, for a 2-story machine shop.

BRIDGEPORT, CONN.—Wright & Corsen Mfg. Co., Fifth and Charlotte streets, will build a 1-story addition to its plant for the production of rivets and machine screw products.

BRIDGEPORT, CONN.—William Olderman Co., smelter and refiner, has been incorporated with $50,000 capital to continue the partnership formerly operating the business and will add a brass foundry.

DERBY, CONN.—Derby Gas & Electric Co., 22 Elizabeth street, will build a 3-story machine shop 42 x 85 feet on Housatonic avenue.

EAST HARTFORD, CONN.—The Carlson Mfg. Co. has been incorporated with $50,000 capital to manufacture machinery by Gustave O. Carlson of Wethersfield, Conn., Carl O. Hedstrom of Portland, Conn., and Henry Hanson of Middletown, Conn.

HARTFORD, CONN.—Union Drawn Steel Co., 775 Capital avenue, is building a 1-story addition 58 x 255 feet, for production of steel devices.

NEW BRITAIN, CONN.—New England Auto Radiator Works, Inc. has been organized with $25,000 capital by Jacob Gordas, Esther Gordas, Isadore Novack and Bella Novack, all of New Britain.

NEW LONDON, CONN.—Mexican Petroleum Co. will take over much of the property of the Groton Iron works. Oil storage tanks and a refinery are planned. The plant was engaged in shipbuilding during the war.

PLAINVILLE, CONN.—Plainville Casting Co. will remodel and add equipment to the plant of the Bay State Castings Co., Westfield, Mass., which it recently bought. Some equipment will be supplied from the Plainville plant.

STAMFORD, CONN.—Electric Specialty Shop, South street, will build a 2-story plant 40 x 104 feet.

WATERBURY, CONN.—Henry Weyand Co. sheet metal manufacturer, will build a 3-story addition on Brown place.

WATERBURY, CONN.—American Metal Hose Co., 67 Jewelry street, is building a 3-story manufacturing plant.

WATERBURY, CONN.—Scovill Mfg. Co., brass and bronze tubing, will build a 1-story foundry addition.

WESTPORT, CONN.—Keith-Kennedy Hardware Co., Inc. has been organized with $50,000 capital by James R. Kennedy, Clarence W. Keith, and Georgie W. Keith, all of Westport.

Where additional information is presented, reference is made to date of issue in which previous item appeared.

SOUTHINGTON, CONN.—Peck, Stow & Wilcox Co. is building an addition 55 x 180 feet to give enlarged facilities.

CLEWISTON, FLA.—Clewiston Iron Co. has been formed and will establish a steel fabricating plant for bridge and ornamental iron work with about 1500 tons per month capacity.

COLUMBUS, GA.—Luminus Cotton Gin Co., F. E. Luminus manager, is building a 1-story machine shop at its plant.

CHICAGO—American Can Co., W. H. Lester division manager, 104 South Michigan boulevard, will build a 4-story manufacturing plant 140 x 160 feet at 6100 South Western avenue.

CHICAGO—Radio Automotive Distributors Inc., 1429 South Michigan avenue, has been incorporated with $2500 capital to manufacture automobile and radio accessories and parts by Milton S. Levy, M. Abeschnier and Max Nedwick.

CHICAGO—Apex Ventilating & Engineering Co., 9 South Clinton street has been incorporated with $5000 capital to manufacture ventilating and heating machinery and equipment by Mina A. Freign, W. R. Leathers, J. M. Ullman and Floyd Young.

CHICAGO—Richard T. Davis Inc., 5252 Broadway, has been incorporated with $10,000 capital to manufacture radio and automobile parts and accessories by M. E. Lawless, A. J. Parker and George Q. Chritton. Dryenforth, Lee, Chritton & Wiles, 1508 Marquette building, are correspondents.

CHICAGO—National Accessories Corp., 332 South LaSalle street, has been incorporated with $50,000 capital to manufacture automobile radiator caps and other accessories by Charles W. Paltzer, Charles A. Pardee and Marie Jung. Charles W. Palzer, 112 West Adams street, is correspondent.

CHICAGO—Sprayola Mfg. Co., 133 West Washington street, has been incorporated with $1000 capital to manufacture spraying, washing and cleaning apparatus and machinery by Robert D. Steele, William H. Craig and C. B. Craig. Holberg, Hummel & Winans, 10 South LaSalle street, are correspondents.

CHICAGO—S. & B. Sewing Machine Co., 805 West Harrison street, has been incorporated with $5000 capital to manufacture sewing machines and motors by Moses Hymen, Jacob Burnstein and Jacob Stein. Samuel B. Falk, 160 North LaSalle street, is correspondent.

CHICAGO—Calumet Structural Iron Works, 717 Monadnock block, has been incorporated with $50,000 capital to do a steel fabricating business by August Hendelman, Benedict A. Seajeaski and Wanda B. Seajeaski. Isadore S. Blumential, Union Trust building, is correspondent.

CHICAGO—Chicago Machinery Mart Building Corp., 842 First National Bank building, has been incorporated to build a structure for housing machinery salesrooms and warehouse space for dealers, requiring special elevators and other equipment, by Frank Schoenfeld, Arthur R. Jones and Arthur R. Jones Jr. Frank Schoenfeld, 76 West Monroe street, is correspondent.

CLEARING, ILL.—United States Can Co., M. S. Hoffman sales manager, 139 South Clark street, will build a 1-story plant 80 x 140 feet.

FREEPORT, ILL.—Auto Zone Co., 202 S avenue, has been incorporated with $20,000 capital to manufacture automobile and gas engine supplies by George X. Cannon, Charles L. Best, Roy M. Bennethum, John W. Henney Jr. and Elwyn Shaw, 115 West Stephenson street.

LITCHFIELD, ILL.—Street Gate Co., 118 East Ryder street, has been incorporated with $10,000 capital to manufacture steel gates, scale racks, hog racks and other farm equipment by J. W. Street, A. D. Lorimer and H. B. Nigg. A. D. Lorimer, 542 Norwood avenue, Collinsville, Ill., is correspondent.

QUINCY, ILL.—Gardner Governor Co., H. Malone purchasing agent, will build a 1-story foundry 100 x 250 feet. Frank D. Chase, 720 North Michigan boulevard, Chicago, is engineer.

WAUKEGAN, ILL.—Chicago, North Shore & Milwaukee railroad, B. I. Budd president, 72 West Adams street, will build a 2-story garage here, 60 x 150 feet.

WOODSTOCK, ILL.—Woodstock Metal Products Co. has been incorporated with $20,000 capital to manufacture dies, jigs, fixtures and tools by H. Paul Gray, Charles E. Low, John M. Hoy, Mac Marsilius and Newman M. Marsilius.

COLUMBUS, IND.—Cummins Engine Co. has bought 14 acres as site for new plant with 20,000 square feet to provide larger production facilities.

EVANSVILLE, IND.—Felthaus Ventilating Machine Co. has been incorporated with $25,000 capital to manufacture machinery and appliances by George H. Felthaus, Guy Loudermilk and Harry Grant.

INDIANA HARBOR, IND.—Acme Acetylene Co., manufacturer of cutting and welding equipment, will build a 1-story plant.

INDIANA HARBOR, IND.—Standard Forgings Co. is having plans outlined for a 1-story foundry to be built in 1926.

INDIANAPOLIS, IND.—The Parts Corp., Albert Kelley president, 733 Virginia avenue, will build a 1-story addition 30 x 100 feet.

NORTH VERNON, IND.—Jennings Mfg. Co. Inc., a newly formed company, has equipped a plant for the manufacture of a foot-operated dustpan.

BALTIMORE—J. C. Eichman Mfg. Co., Wicomico and Bush streets, plumbing equipment, will build a 1-story addition 50 x 149 feet.

BALTIMORE, MD.—Detrick & Harvey Machine Co. has been incorporated with $375,-

Iron and Manganese Ores and Minerals

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old Range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent	9.00 to 10.00
Copper free low phosphorus 53 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, f.o.b. cars Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	9.00 to 10.00
Algerian low phosphorus, 52 to 54 per cent	9.00 to 10.00
Riff low phosphorus, 65 to 66 per cent	9.50 to 10.00
Swedish and Norwegian low phosphorus, 68 per cent	11.00 to 11.50
Swedish foundry or basic, 66 to 68 per cent	9.00 to 10.00
Spanish foundry or basic, 50 to 54 per cent	8.50 to 9.00
Algerian foundry and basic, 50 to 54 per cent	8.50 to 9.00

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent.....nominal
Indian minimum 47 per cent.....nominal
Caucasian, 53 to 55 per cent.....
....Washed, 43 to 45 cents c.i.f. tidewater

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton..	$16.00
Washed gravel, imported duty paid eastern tidewater, per net ton	16.50 to 17.50

000 capital by J. W. Niedhardt president, and associates. A plant is being established at 508 East Preston street.

ATHOL, MASS.—N. D. Cass Co. toy manufacturer, will build a 4-story addition to its finishing plant. Taylor-Wheeler Corp. has the general contract.

BOSTON—T. H. Davis, 65 Union street, Newton, will build a 1 and 2-story auto repair shop 55 x 80 feet.

BOSTON—Julian d'Este Co., Charlestown, suffered a severe fire loss in its brass and bronze foundry, which will be rebuilt.

LAWRENCE, MASS.—The Souhigian Snow-Removing Machines Co. has been incorporated with $25,000 capital by Marsop Souhigian, Solomon Souhigian and Magurdich Antriasian, all of Lawrence, Mass.

WEST SPRINGFIELD, MASS.—New England Smelting Co., 220 Union street, is having figures and plans prepared for a 1-story plant.

WOBURN, MASS.—Woburn Iron Foundry will rebuild its burned foundry and will require additional equipment.

WORCESTER, MASS.—Crompton & Knowles Loom Works Inc., manufacturer of textile machinery, will build a 4-story addition 40 x 74 feet.

BAY CITY, MICH.—Kuhlman Electric Co., manufacturer of electric transformers, is building a 2-story addition 75 x 250 feet, equipped with 10-ton crane.

DETROIT—Cadillac Refrigerator Co. has been incorporated with $50,000 capital to manufacture refrigerators by Joseph Barsky, Detroit, Dan Olson, Sibley, and Frank D. Sorensky, 2819 Cody street, Detroit.

FLINT, MICH.—A. C. Spark Plug Co. is enlarging its plant to provide facilities for manufacturing automotive accessories, mufflers and heaters to be added first.

GRAND RAPIDS, MICH.—Knape & Vogt Mfg. Co., Richmond and Muskegon avenues, will build a 1-story addition 30 x 90 feet for the manufacture of cabinet hardware. B. Hogan & Son have the general contract.

JACKSON, MICH.—Jackson Steel Products Co. will build a warehouse addition 140 x 170 feet, steel construction.

JACKSON, MICH.—Riverside Forge & Machine Co. will build a 1-story addition. General contract has been let to the Austin Co., Cleveland.

MONROE, MICH.—Monroe Auto Equipment Co., C. S. McIntyre general manager, will rebuild its burned plant, one story, 30 x 36 feet and 81 x 150 feet.

PONTIAC, MICH.—Grand Trunk railroad, Willow avenue, C. B. Brown chief engineer, will build a roundhouse 115 x 600 feet.

PONTIAC, MICH.—Fisher Body Corp. is adding three buildings to its plant, a 2-story structure 150 x 160 feet, a 1-story building of 10,000 square feet and an office building addition with 2500 square feet.

SAGINAW, MICH.—Saginaw Products Co. is adding to its gray iron foundry facilities and building an addition to its power house. About $250,000 will be expended.

KANSAS CITY, MO.—W. W. Brown Machine Works has leased building at 125-7 Southwest boulevard, containing 5000 square feet, for new plans.

KANSAS CITY, MO.—Black, Sivalls & Bryson have completed new fabricating plant, 180 x 488 feet, for manufacture of oil field tanks, with maximum capacity of 20,000 tons of steel yearly.

KANSAS CITY, MO.—Buckeye Traction Ditcher Co. has leased 1-story and basement building at 1809 Grand avenue, 25 x 100 feet, for branch office and warehouse. F. A. Gross is district manager.

KANSAS CITY, MO.—Moe-Bridges Co. has been incorporated with $50,000 capital to manufacture lamps and lighting fixtures by Henrick Moe and C. C. Clark, 10 East Sixteenth street.

POPLAR BLUFF, MO.—Oil Well Supply Co., 215 Water street, Pittsburgh, will rebuild its burned plant here.

SPRINGFIELD, MO.—Standard Semi-steel Foundry Co., C. Wilks general manager, Clinton, Mo., will build a 1-story foundry 64 x 200 feet on West Chase street.

ST. LOUIS—Southern Wheel Co., Frank C. Turner vice president, Commonwealth building, Pittsburgh, will build a 1-story steel foundry on Goodfellow avenue.

ST. LOUIS—Mississippi Warrior Barge Line Service, federal reserve bank building, J. P. Higgins manager, is said to be in the market for 20 steel barges of 2000 tons capacity each.

ST. LOUIS—Nee-Wat Method Inc. has been incorporated with $100,000 capital to build and repair boilers and devices for preventing rust in them by George S. Hessenbruch, Herman Kroemer and A. Dundon, 6337 Virginia avenue.

ST. LOUIS—Ice-O-Matic Co. has been incorporated with 500 shares no par value to manufacture machinery, equipment and supplies by Walter F. Koken, Leo M. Grace, G. Horton Blackman and W. G. E. Rolaff. Theodore E. Kircher, Belleville, Ill., is attorney.

BLOOMFIELD, N. J.—Contract has been awarded by the Westinghouse Lamp Co., 120 Broadway, New York City, for a 2-story research laboratory here, 93x113 feet.

IRVINGTON, N. J.—Lionel Corp., 605 South Twenty-first street, manufacturer of electric toys has bought 12 acres as the site for a plant.

NEWARK, N. J.—General Tube Co., 56 Earl street, will build a 1-story factory 90 x 200 feet.

NEWARK, N. J.—United States Piston Ring Co., 1206 South Grove street, will build a 1-story addition.

NEWARK, N. J.—Plans are being prepared by the United Radio Corp., for the reconstruction of its plant, which recently suffered $70,000 by fire.

NEWARK, N. J.—Diamond Electric Specialties Corp., 101 South Orange avenue, has leased a site at 12 Runyon street for a plant site.

HAGAN, N. M.—Hagan Power Co., Dr. J. J. DePraslin president, will build a high tension transmission line to Golden, N. M., ten miles, to supply power for mining operations.

BATAVIA, N. Y.—Dean Rider, Hamilton, Ont., is planning erection of an automobile headlight manufacturing plant.

BUFFALO, N. Y.—William J. Teere, 1089 Genesee street, will build a 1-story addition to his welding and machine shop.

BUFFALO, N. Y.—Donner Steel Co. will build two additions, a roll shop and a finishing department, at its plant at 375 Abbott road.

BUFFALO, N. Y.—Faul & Timmins, A. C. Faul president, 149 Oak street, manufacturer of power plant equipment, will build a second story on its plant to enlarge production facilities.

EASTWOOD, N. Y.—Lamson Co. has let contract to H. K. Ferguson Co., Cleveland, for a structural shop 60 x 200 feet, one story.

NEW ROCHELLE, N. Y.—Dependable Oil Burner Co. has been incorporated with $8000 capital to manufacture fuel devices by C. S.

(*Continued on Page* 1385)

Warehouse Volume Continues Heavy

Prices Maintain Recent Advances—Sheets Again Stiffen

DEMAND for products from iron and steel warehouses continues heavy. November sales totals will approximate October's. Prices are firm, recent advances being established.

Jobbers in the New York metropolitan district again have advanced galvanized sheets, the market now holding at 5.50c. Black sheets are unchanged at 4.35c, but are likely to undergo a further advance shortly. Active demand, in conjunction with an increasingly tight position at the mills, is the principal factor. Trading is brisk in shapes, plates and bars, as well as in sheets.

Buffalo jobbers continue to profit by increasing congestion of mill schedules and more small orders are going to warehouses. November business has been of good volume. Prices are firm and strictly maintained.

Cincinnati warehouse demand has picked up considerably, especially for plates, sheets and bars. Milder weather has helped the demand. Jobbers are expected to adopt new extras on cold-finished stock this week.

Philadelphia jobbers have advanced cold-drawn steel stock $2 a ton, and now are quoting 4.00c and 4.50c. Cold-rolled strip has been advanced $3 a ton and now is 6.25c. Blue annealed also has been raised $3 a ton. Jobbers are using new extras on cold drawn steel but are not making any extra charge for screw stock. Business is somewhat smaller in quantity due to approach of Thanksgiving.

Detroit warehouse trade continues firm. Tonnage being moved compares favorably with tonnage moved last month. The increase last week of $3 a ton on cold-rolled strip and wire has had no effect on the demand for these products. Sheets are strong and the supply somewhat limited. As a result some of the smaller operators have increased prices slightly.

The new extra card on cold-finished steel and shafting has been put into effect by Chicago warehouses with the exception of the extra for screw stock quantity.

San Francisco jobbers have advanced prices on sheets from $1 to $5 a ton, while Los Angeles warehouses have dropped bars $2, shapes $2 and bands $7 and raised sheets from $2 to $5 a ton.

Quotations at Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.10c
Detroit	3.15c
Los Angeles	3.05c
New York	3.24c
Philadelphia	3.05c to 3.20c
Pittsburgh	2.90c
Portland	2.85c
San Francisco	3.30c
Seattle	3.25c
St. Louis	3.15c
St. Paul	3.25c

IRON BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
New York	3.24c
Philadelphia	3.05c to 3.20c
St. Louis	3.25c

REINFORCING BARS

Boston	3.265c to 3.50c
Buffalo	3.30c
Chicago, billet	2.60c
Chicago, rail steel	2.00c to 2.10c
Cincinnati	3.30c
Cleveland	2.85c to 3.10c
Detroit	3.15c
Los Angeles, C. L.	3.05c
Los Angeles, L. C. L.	3.30c
New York	2.95c to 3.15c
Philadelphia	3.00c to 3.25c
Pittsburgh	2.50c to 2.60c
San Francisco, C. L.	3.35c
San Francisco, L. C. L.	3.80c
Seattle	3.50c
Youngstown	2.50c

STANDARD STRUCTURAL SHAPES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.20c
Detroit	3.25c
Los Angeles	3.05c
New York	3.34c
Philadelphia	2.60c to 3.20c
Pittsburgh	3.00c
Portland	2.85c
San Francisco	3.30c
Seattle	3.35c
St. Louis	3.25c
St. Paul	3.35c

PLATES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.20c
Cleveland, 3/16-inch	3.425c
Detroit	3.25c
Detroit, 3/16-inch	3.45c
Los Angeles	3.15c
New York	3.34c
Philadelphia	2.60c to 3.20c
Philadelphia, 3/16-inch	2.80c to 3.40c
Pittsburgh	3.00c
Portland	3.25c
San Francisco	3.30c
Seattle	3.25c
St. Louis	3.25c
St. Paul	3.35c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	3.915c
Buffalo	3.80c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.15c
Detroit	3.65c
Los Angeles	3.70c
New York	3.89c
Portland	4.50c
Philadelphia	3.50c
San Francisco	3.75c
Seattle	4.50c
St. Louis	3.65c
St. Paul	3.75c

NO. 28 BLACK SHEETS

Boston	4.95c
Buffalo	4.40c
Chicago	4.10c
Cincinnati	4.55c
Cleveland	3.95c
Detroit	4.25c
Los Angeles	4.75c
New York	4.35c
Philadelphia	4.55c
Portland	5.50c
San Francisco	4.75c
Seattle	5.50c
St. Louis	4.60c
St. Paul	4.35c

NO. 28 GALVANIZED SHEETS

Boston	6.00c
Buffalo	5.45c
Chicago	5.25c
Cincinnati	5.65c
Cleveland	5.10c
Detroit	5.25c
Los Angeles (corr. 28 ga.)	6.00c
New York	5.50c
Philadelphia	5.75c
Portland	6.50c
San Francisco	6.00c
Seattle	6.50c
St. Louis	5.70c
St. Paul	5.50c

BANDS

Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.85c
Detroit	3.80c
Los Angeles	3.90c
New York	3.99c
Philadelphia	3.90c
Pittsburgh	3.60c
Portland	4.25c
San Francisco	4.15c
Seattle	4.25c
St. Paul	3.90c

HOOPS

Boston	5.50c
Buffalo	4.05c
Chicago	4.15c
Cleveland	3.85c
Detroit	4.30c
New York	4.49c
Philadelphia	4.25c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds and hexagons	Flats and squares
Boston	3.95c	4.45c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.90c	4.40c
Detroit	3.75c	4.25c
Los Angeles	5.25c*	.....
New York	4.00c	4.50c
Philadelphia	4.00c	4.50c
Pittsburgh	3.60c	4.10c
Portland	5.00c*	.....
San Francisco	3.75c*	.....
Seattle	5.00c*	.....
St. Paul	3.85c	.....

*Rounds only.

COLD ROLLED STRIP

Boston, .100 inch, 500 lb. lots	6.30c
Buffalo	6.65c
Chicago	6.25c
Cincinnati	7.15c
Cleveland, over 500 pound lots	5.95c
Detroit	6.20c
New York	6.25c
Philadelphia	6.25c
Pittsburgh	6.30c

FOREIGN IRON AND STEEL

New York, duty paid

Swedish hollow drill steel	15.00c
Swedish iron bars round	6.75c
Flats and squares	7.00c

WELDED PIPE

Discounts from warehouse, New York City

Standard Steel Pipe

WROUGHT STEEL PIPE

	Black	Galvanized
⅛-inch butt	—23	+21
¼ to ⅜-inch butt	—36	— 3
½-inch butt	—46	—29
¾-inch butt	—51	—37
1 to 3-inch butt	—53	—39
2-inch lap	—40	—22
2½ to 6 inch lap	—48	—35
7 and 8-inch lap	—44	—17
9 and 10-inch lap	—38	—14
11 and 12-inch lap	—37	—13

WROUGHT IRON PIPE

	Black	Galvanized
⅛ to ⅜-inch butt	+44%	+78%
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1 to 1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
2½-inch lap	— 9	+ 9
3 to 6-inch lap	— 3	+ 6
7 to 12-inch lap	— 3	+16

Construction and Enterprise

(*Concluded from Page* 1383)

Wurtz, R. Wennik and A. K. Haft. J. M. Schwartz, 1 Madison avenue, is attorney.

NEW YORK—W. & L. Garage Co., 25 Delancey street, Samuel Witkin president, will build a 3-story garage and repair shop 75 x 100 feet.

NEW YORK—American Brake Shoe & Foundry Co., 30 Church street, is planning construction of a foundry at Pittsburgh for gray iron and nonferrous metals.

NEW YORK—Permanent Metal Weatherstrip Co. has been incorporated with $5000 capital by J. L. Diamond and M. B. Moskowitz. J. A. Byrne, 305 Broadway, is attorney.

NEW YORK—Raven Rock Metal Works Co. has been incorporated with $10,000 capital to manufacture metal novelties by A. Wolff, A. Kunze and K. Kosellek. W. F. Timme, 350 Madison avenue, is attorney.

NEW YORK—Dee Machine Co. has been incorporated with $10,000 capital to manufacture and repair machinery by C. Goldberg and F. Levy. H. Amster, 276 Fifth avenue, is attorney.

NEW YORK—S. A. Birdsong Co. has been incorporated with 1000 shares at $100 each and 2000 shares common stock no par value, to manufacture slot vending machines by S. A. Birdsong, F. S. Peters and G. W. Walsh. J. C. Cleary, 51 Chambers street, is attorney.

NEW YORK—Bedford Empire Metal Ceiling Corp. has been incorporated with $30,000 capital to manufacture metal stampings by W. Flam, J. Flam and H. Greenberg. S. D. Johnson, 110 West Fortieth street, is attorney.

NEW YORK—Jamestown Metals Engineering & Supply Co. has been incorporated with 100 shares preferred stock at $100 each and 300 common at $50 each to manufacture office furniture by N. Unger, D. Ehntholt and T. T. Haac. McKennell & Appell, 17 East Forty-second street, are attorneys.

OLEAN, N. Y.—Pennsylvania railroad will build an addition to its repair shops 112 x 175 feet.

ASHVILLE, N. C.—T. C. Coxe will build a 3-story service and repair garage 130 x 140 feet. A. Wirth is architect.

MONROE, N. C.—Griffin Price Implement Co. has been incorporated with $50,000 capital by Joel W. Griffin and H. L. Price.

BUCYRUS, O.—Bucyrus Iron Products Co. has been incorporated with $25,000 capital by Elmer Heedeen, Edward Heedeen, Lois Heedeen, Olive H. Kahle and D. W. Kahle.

CINCINNATI, O.—Blymyer Iron Works Co.

Industrial Business Changes

LUNDGREN-STEVENS CO., Peoples Gas building, Chicago, has been appointed sales representatives in Illinois, Indiana, Wisconsin and Michigan for William W. Hearne Inc., Philadelphia, importer and distributor of sheet pickle products.

* * *

Safety Insulated Wire & Cable Co., Bayonne, N. J., has acquired control of the A. A. Wire Co., Harrison, N. J., and the Phillips Wire Co., Pawtucket, R. I.

* * *

Perrigo Foundry & Machine Co., Beloit, Wis., has changed its name to the Progressive Mfg. Co.

* * *

American Body Co., Dallas, Tex., has established a plant and branch office at Shreveport, La., and has incorporated under the name of the American Body Co. of Louisiana. A. L. Waller, Shreveport, is president.

* * *

Buffalo Machine & Iron Co., Buffalo, N. Y., has changed its name to the Lake Erie Engineering Co.

* * *

Union Mfg. Co., New Britain, Conn., has appointed the Strong, Carlisle & Hammond Co., Cleveland, distributor of its chucks in that territory.

* * *

Union Cutlery & Hardware Co., Unionville, Conn., has been dissolved, according to announcement of F. P. Blish, formerly president of the company.

* * *

Cleveland Automatic Machine Co., Cleveland, has established a sales office in the Singer Annex building, New York, in charge of A. W. Schafer as district manager.

* * *

Moltrup Steel Products Co., Beaver Falls, Pa., has appointed Green & Patterson, Monadnock building, San Francisco, its coast representatives, succeeding W. J. Patterson & Co.

* * *

Miller, Carson & Co., Philadelphia, pig iron, coke and coal merchants, have changed their name to J. G. Miller & Co., without change in location, policy or personnel. J. G. Miller is president and Irvin V. Shaw is sales manager.

* * *

Oil Jack Co., Inc., New York, has opened a branch office in the Wrigley building, Chicago, in charge of Fred D. Sweet, formerly with the Steel Products Corp.

* * *

Climax Engineering Co., Clinton, Iowa., has appointed T. L. Keeling sales representative at Cleveland, 657 Leader building, in charge of sales in Ohio and western New York and Pennsylvania.

* * *

Foote Bros. Gear & Machine Co., Chicago, has appointed the Power Equipment Co., 315 Third avenue north, Minneapolis, Minn., its representative in that territory.

* * *

Plainville Casting Co., Plainville, Conn., has bought the plant of the Bay State Castings Co., Westfield, Mass., and will operate it as a subsidiary production unit.

* * *

Red Oak Iron & Metal Co., Red Oak, Iowa., has been bought by D. A. and P. H. Sherman of Des Moines, Iowa.

* * *

James Howden & Co. of American Inc., 25 Broadway, New York, has sold its business to the Air Preheater Corp.

* * *

Standard Silica Co., Ottawa, Ill., has bought the Crescent Silica Co. of the same city, including 82 acres and concrete and steel washing and drying plant and other equipment, doubling its capacity.

* * *

Smith & Williams Co., Salisbury, Md., John Smith president, has been organized to take over and enlarge the shipbuilding business formerly operated by the partnership known as Smith & Williams.

* * *

Philip R. Pratt Mfg. Co., has been formed at Deep River, Conn., to take over the wire manufacturing business and plant of the Potter & Snell Co., control of the company passing from Gen. Matthewson W. Potter to Philip R. Pratt.

has been incorporated with $5000 capital by Edgar F. Wendt, Floyd C. Williams, Ralph G. Irving, Harrison G. Heis and Roger Broadwell.

FREMONT, O.—Claus Cutlery Co., Henri Claus president, is planning a 3-story plant 50 x 80 feet on McPherson highway.

PORTSMOUTH, O.—Jackson Valve & Mfg. Co. Inc., 1106 Fifteenth street, manufacturer of high pressure steam valves, will build a foundry and machine shop to produce and finish its own castings.

TOLEDO, O.—Allen Filter Co., C. H. Wachter president, 25 South St. Clair avenue, will build a 1-story factory and office building 70 x 80 feet. General contract to Edward Voss, 428 Huron street.

HENRYETTA, OKLA.—North End Coal Co., capital $10,000, chartered by Ira Exley, Bokoshe, Okla., R. R. Fretwell and Mattie Fretwell will engage in coal mining operations.

OKLAHOMA CITY, OKLA.—Arnold's Iron & Steel Mills, capital $37,500, incorporated by J. W. Arnold, 511 East Seventh street, J. E. Arnold and Ed Overholser.

OKMULGEE, OKLA.—Chas. A. Butler Mfg. Co., capital $100,000, chartered by C. A. Butler, 700 North Alabama street, L. W. Cranston and C. E. Reynolds, to manufacture steel tanks and oil field supplies.

PORTLAND, ORE.—J. C. Bayer is building a 1-story foundry at 477 East Thirtieth street. C. W. Ertz Co. has the general contract.

ALLENTOWN, PA.—The Bonney Forge & Tool works contemplates the erection of a plant addition.

CHESTER, PA.—Bids were closed November 19 on a factory building here for the Ford Motor Co.

LEBANON, PA.—Lebanon Drop Forge Co. is rebuilding its burned shop and adding to its size to accommodate equipment of the Hazleton Drop Forge Co., Hazleton, Pa., recently purchased.

PHILADELPHIA—Dot Lubricator Co. of Eastern Pennsylvania has been incorporated with $5000 capital by Harold A. Ball and others, 613 Drexel road.

PHILADELPHIA—Work will be started at once upon the erection of a manufacturing building for Eugene Carraine on N street near Kensington avenue.

PHILADELPHIA—The Bolinger Co., architects of this city received bids Nov. 29 for a manufacturing plant for the Viscose Co., Parkersburg, W. Va.

PHILADELPHIA—Pennsylvania Range Boiler Co., has bought a site at Washington avenue and Twenty-fourth street and will equip a new plant.

PHILADELPHIA—Philadelphia Shovel Co., Lynford Rowland treasurer, recently incorporated with $100,000 capital, will build a new plant. W. N. Lindsay & Co., 900 Harrison street, has the general contract.

PHILADELPHIA—Bids have been closed by the General Electric Co. for the erection of a galvanizing building, at Sixty-eighth street and Glenmore. Harris & Richards are the architects in charge.

PHILADELPHIA—Haines, Jones & Cadbury Co., 1136 Ridge avenue, manufacturer of pipe fittings and plumbing supplies, will build a 2-story factory and warehouse 60 x 120 feet at Biltmore, N. C.

PHILADELPHIA—Philadelphia Engineering & Machine Co., J. B. Tripple, president, 1130 Race street will build a 1-story factory building, 50 x 198 feet at 3456 Ludlow street. D. Henwood, 717 South Sixty-third street, has been given the general contract.

Refractories

FIRE CLAY BRICK
Per 1000 f.o.b. works

Pennsylvania, No. 1	$43.00 to 46.00
Pennsylvania, No. 2	35.00 to 40.00
Ohio, No. 1	43.00 to 46.00
Ohio, No. 2	38.00 to 40.00
Illinois, No. 1	40.90 to 43.00
Illinois, No. 2	35.00 to 38.00
Kentucky, No. 1	43.00 to 45.00
Kentucky, No. 2	40.00 to 43.00
Missouri, No. 1	40.00 to 43.00
Missouri, No. 2	35.00 to 38.00
Maryland, No. 1	43.00 to 47.00
Maryland, No. 2	39.00 to 42.00

SILICA BRICK

Pennsylvania	40.00
Chicago	49.00
Birmingham	48.00 to 52.00

MAGNESITE BRICK
Per Net Ton Seaboard Base

9 x 4½ x 2½	65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	45.00 to 48.00

PITTSBURGH—Pittsburgh Garage Co. has bought a site 90 x 172 feet and is having plans made for a service and repair garage.

POTTSTOWN, PA.—The Reading Co. closed bids Nov. 24 on the erection of a garage and a warehouse in this city.

WARREN, PA.—Penn Furnace & Stove Co. has bought additional land adjoining its plant and will build a 2-story addition for which equipment will be required.

WILKES-BARRE, PA.—Plans are being prepared by the Vulcan Iron Works for a factory building to replace one recently badly damaged by fire.

WESTERLY, R. I.—Bids are being received by this city for a $25,000 pumping station, which will include a machine shop. W. P. Arnold, Meriden, Conn., is engineer in charge.

DUCKTOWN, TENN.—Ducktown Chemical & Iron Co., recently incorporated in Delaware, has bought the properties and business of the Ducktown Sulphur, Copper & Iron Co., which will be improved and additional equipment installed, with plans for an iron sintering department.

HOUSTON, TEX.—Emsco Derrick & Equipment Co., E. M. Smith president, 7111 South Alameda street, Los Angeles, is planning construction of a branch plant here.

VERNON, TEX.—Vernon Electric & Ice Co., R. H. Smith manager, is remodeling and enlarging its plant, adding a 57-horsepower engine and 400-kilowatt generator.

DANVILLE, VA.—W. M. Doucette of New York will build a plant for the manufacture of spark plugs for automotive use.

SEATTLE—Machine shop and foundry of Ballard Drop Forge Co. were burned and equipment destroyed.

SEATTLE, WASH.—Harbor Island Brass Foundry has been incorporated with $17,500 capital by J. D. Carmichael, George D. Davis and O. R. G. Thayer.

SEATTLE, WASH.—Harbor Island Brass Foundry has been incorporated with $17,500 capital by J. D. Carmichael, George D. Davis and O. R. G. Thayer.

WILLIAMSON, W. VA.—Portsmouth By-Products Coke Co. is planning a steel tipple for use of three mines at Freeburn.

GREEN BAY, WIS.—The Joseph Rothe Foundry Co., 620 Willow street, is building a $50,000 addition to its shop, 66x120 and 40x 66 feet, and is in the market for new equipment, sand screening machine, etc.

LA CROSSE, WIS.—Contracts have been let by the Trane Co., Second and Cameron streets, for additions costing $85,000 to its plant and warehouses. The concern manufactures materiels, devices and supplies for the steam and hot water heating industry.

MANITOWOC, WIS.—Bids are being taken by the A. M. Richter & Sons Co., manufacturer of vinegar, for an inclined conveyor system and spiral chutes for the addition now under construction at its plant No. 2. The addition will cost about $40,000 in all.

MILWAUKEE—International Harvester Co. has let contract to the Austin Co. for a manufacturing building 145 x 200 feet.

MILWAUKEE—Board of public works will open bids shortly for three horizontal return tube boilers 72 inches by 18 feet, with stokers. R. E. Stoelting, commissioner of public works.

MILWAUKEE—The A. L. H. Realty Co., 454 33d street, will build a 2-story plant, 50 x 100 feet, at 1422 Richards street, for use by the Wisconsin Paint Mfg. Co., Milwaukee, an affiliated concern.

MILWAUKEE—The city is about to let contracts for the erection of a machine shop at the North Point pumping station to the municipal water works. With the machinery, it will cost about $25,000.

Business in Canada

WINNIPEG, MAN.—Bids will be received by the city clerk, C. J. Brown, city hall, until Dec. 21, for the supply and installation of the following equipment for the electrification of the high pressure plant here: two electrically driven centrifugal pumping units 1800 imperial gallons per minute each; four 400-horsepower, 3-phase induction motors; four chain or gear drives required to transmit 500 horsepower to high pressure engine shafts. Plans and specifications with city engineer, 223 James street.

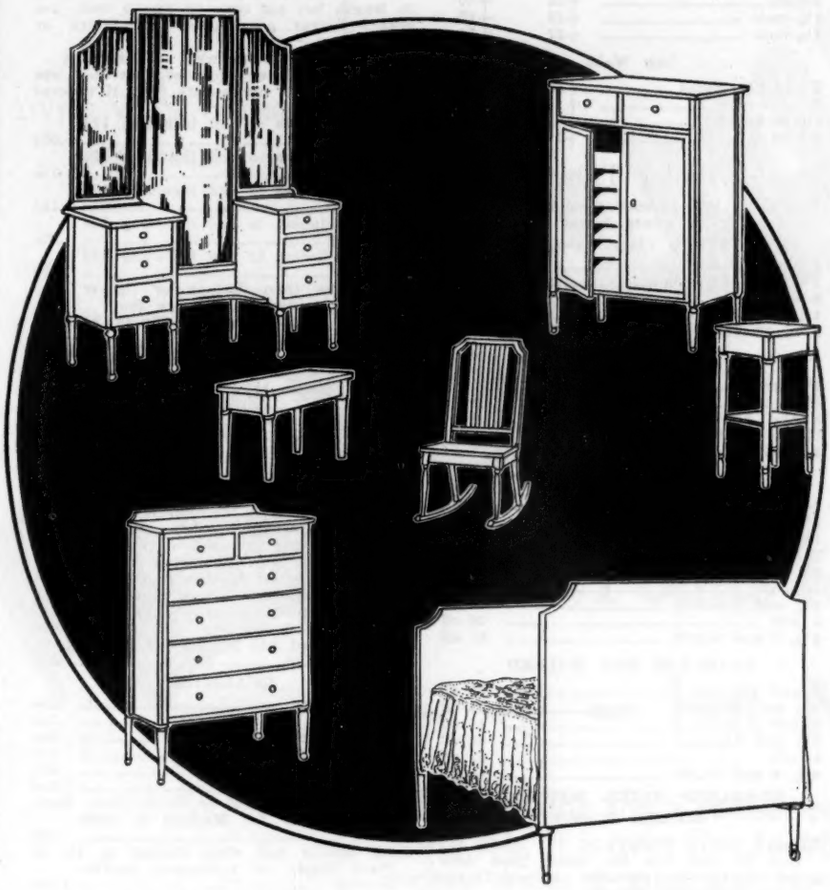
FORT WILLIAM, ONT.—The Kaministiquia Power Co. Ltd. has been incorporated with a capital stock of $1,250,000; by Joseph G. Gibson, Harold W. Keyes, Ernest P. Scon and others all of Toronto, Ont., as provisional directors, to construct, develop and acquire power plants, etc.

KITCHENER, ONT.—The Grimes Radio Corp. Ltd. has been incorporated to manufacture radio sets, equipment, tools, etc., with $40,000 capital stock; by Arthur B. Pollock, Alexander H. Walker, William P. Clement and others.

OWEN SOUND, ONT.—The Corbet Machine & Gear Co. Ltd. has been incorporated to carry on business as iron founders, mechanical engineers, to manufacture machinery, tools, etc., with $340,000 capital stock; by Richard Corbet, William P. Telford, John F. P. Birnie and others. The company will extend its operations to include manufacture of the Stevenson multiple shaper and gear cutter.

PRESTON, ONT.—The Kirkwood Mfg. Co. has taken over the plant and equipment of the Electrical Fittings & Foundry Co. here, and is putting the plant in shape and adding some machinery for the manufacture of electric conduit fittings, drawn steel switches, outlet boxes, ornamental lighting fixtures, and will also carry on business as gray iron founders.

Furniture for the finest or simplest homes



The artistic designs and color finishes of Metal Bedroom Furniture appeal to the critical taste of the lady who lives on the drive as much as its reasonable cost appeals to the young housewife who lives in the suburbs.

Palatial homes and cozy cottages find in this type of Bedroom Furniture, *style* and *value* that make it an ideal choice for all classes of people.

There are a variety of color finishes that lend themselves to any scheme of decoration. These finishes do not chip, stain or scar. Medicine may be upset and perfume spilled on Metal Bedroom Furniture without leaving a noticeable mark. Lighted cigars or cigarettes, forgotten, will not sear its surface. Dampness nor dryness do not affect it.

Metal Bedroom Furniture requires little care, is immune to ordinary accidents of the home and retains its beautiful finish for the generations that will later inherit it.

Mansfield Metal Furniture Sheets are used extensively as the basic material in the products of the largest manufacturers of Metal Bedroom Furniture. They are rolled from Mansfield-poured ingots. This distinctive method of pouring combined with scientific treatment of the metal in the open-hearth furnace and careful tests and inspections in every step of manufacture insures a finished sheet of unusual character. Mansfield Sheets are remarkably uniform in both finish and quality.

We also manufacture Automobile Sheets, "Wabik Metal" Sheets for Vitreous Enameling, Milk Can Stock, Electrical Sheets, Pickled and Annealed Enameling Stock for Kitchen Utensils. Sheet Bars and Ingots.

MANSFIELD

METAL FURNITURE SHEETS

Mansfield Sheet & Tin Plate Company

Mansfield, Ohio

District Sales Offices:
12-237 General Motors Bldg., Detroit, Mich.
1372 Wrigley Bldg., Chicago, Ill.
410 Pierce Bldg., St. Louis, Mo.
1106 National City Bldg., New York, N. Y.
2002 Union Trust Bldg., Cleveland, Ohio
1504 West Venango Street, Philadelphia, Pa.

Contributing Member
SHEET STEEL
TRADE EXTENSION COMMITTEE

District Sales Offices:
1403 Merchants Bank Bldg., Indianapolis, Ind.
1020 Union Trust Bldg., Cincinnati, Ohio
640 Endicott Bldg., St. Paul, Minn.
237 Rialto Bldg., San Francisco, Calif.
509 Wilcox Bldg., Los Angeles, Calif.
1426 L. C. Smith Bldg., Seattle, Wash.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount or $4 per ton higher net.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis or $5 per ton higher net.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	48	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	46½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	12½
¾ to 1½-inch	45	35½
2 to 3½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	33	25½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis

THREADS AND COUPLINGS

Butt Weld

¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon	application
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+40
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Welded)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
4¼ to 8¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2½-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent	55 off
Carbon, 0.30 to 0.40 per cent	50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per Pound for Width or Diameter.

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼ inch thick and heavier.

GAGE

Plates not Exceeding 72 inches Wide

Plates less than ¼-inch gage, to and including ⅜-inch; or lighter than 10.2 pounds per square foot to and including 7.65 pounds per square foot 20c

Plates Over 72 inches Wide

Plates less than ¼-inch gage, to and including ⅜-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot ..... .20c

Plates ordered 7.65 pounds per square foot ..... .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull material subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept., or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection ..... No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH or DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet....No extras

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.25c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (including straight taper plates)

Additional extra ..... .10c

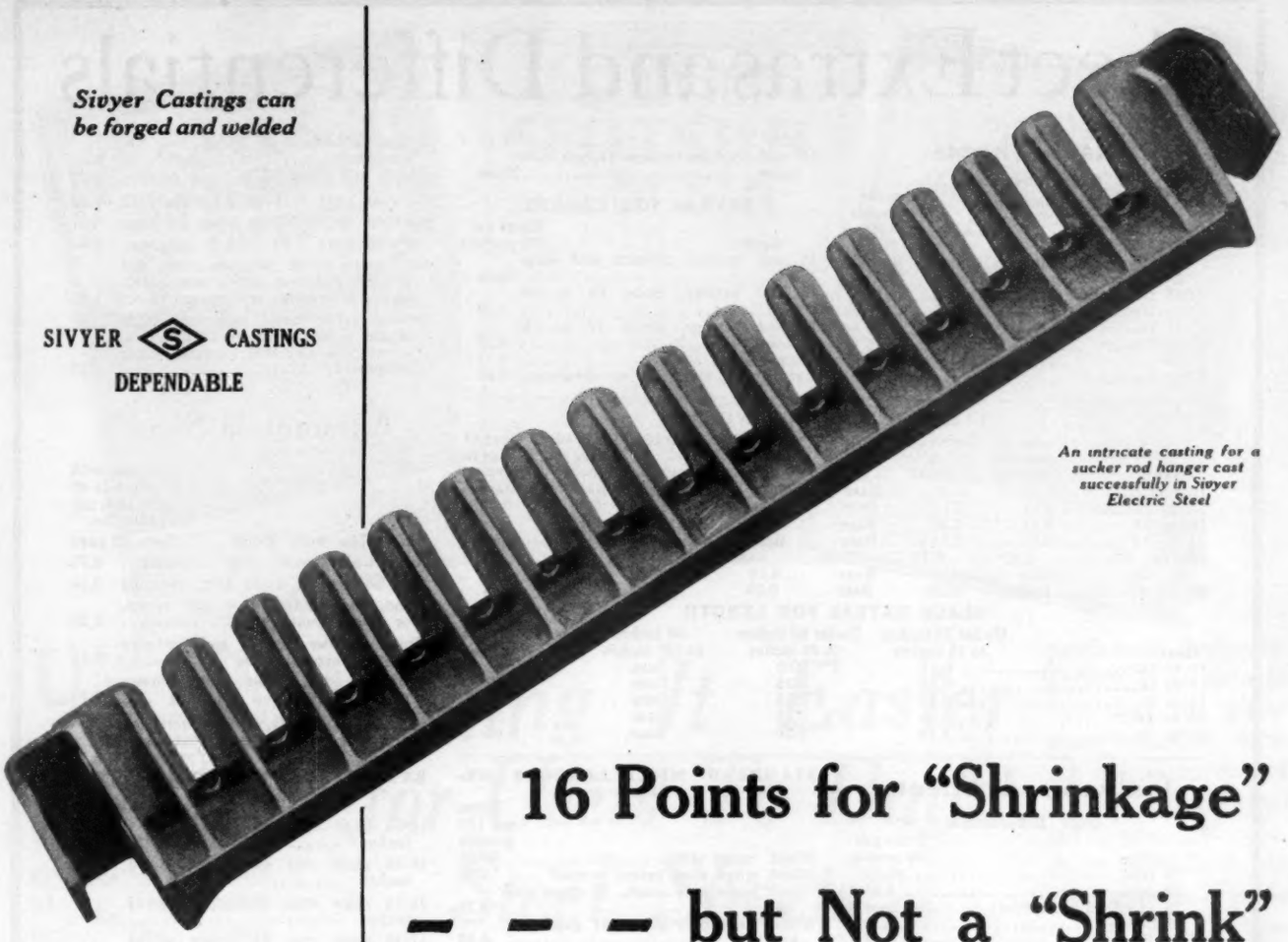
Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .30c

Sivyer Castings can be forged and welded

SIVYER CASTINGS
DEPENDABLE



An intricate casting for a sucker rod hanger cast successfully in Sivyer Electric Steel

16 Points for "Shrinkage" - - - but Not a "Shrink"

THIS casting for a sucker rod hanger is a real casting job. It is over five feet long and about eighteen inches wide, it carries sixteen teeth. Each tooth is a casting problem in itself. The metal sections vary sharply from 1/4 to 1 inch and such sharply varying thin sections tend to develop large "shrink holes." As a result, exceptional foundry practice must be called into play to assure a casting of interior soundness. "Gates," "feeders," "risers" and "heads" must be properly located and distributed to feed the thicker sections and to draw the "shrinks" from them. The fact that this particular pattern is being cast successfully in Sivyer Electric Steel illustrates two things —first, soundness and carefulness of Sivyer Foundry Practice—second, why so many parts, that have been unsuccessful when made by other methods or in other metals, are now being cast in Sivyer Electric Steels.

If you are having trouble with any of your parts—if they are not giving the service that you think they should—if they entail excessive machining—if they haven't the strength to stand the "gaff" of their job—Sivyer Electric Steels and Alloy Steels may be the solution of your problem.

In addition to the inherent strength of Sivyer metals is the careful foundry practice that makes such jobs as the one pictured here possible.

If you will send us blue prints of the parts giving trouble we'll be glad to make recommendations and suggestions without obligation to you.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Sheet Extras and Differentials

Black Sheets

Gage Differentials

Gage	Price per 100 pounds
30 Add	$0.20
29 Add	0.10
28 (Carload quantities)	Base
27 Deduct	0.05
25-26 Deduct	0.10
22-24 Deduct	0.15
17-21 Deduct	0.20
15-16 Deduct	0.25
13-14 Deduct	0.30
10-12 Deduct	0.35

BLACK EXTRAS FOR WIDTH

Gages	Under 12 inches to 6 inches	Under 24 inches to 12 inches	24 inches to 32 inches	Over 32 inches to 36 inches	Over36 inches to 40 inches	Over 40 inches to 44 inches	Over 44 inches to 48 inches
10 to 16	0.20	0.10	Base	Base	Base	Base	Base
17 to 18	0.25	0.15	Base	Base	0.05	0.05	0.05
19 to 21	0.25	0.15	Base	Base	0.15	0.15	0.25
22 to 24	0.25	0.15	Base	Base	0.20	0.40	0.40
25 to 27	0.30	0.20	Base	Base	0.20	0.40	...
28	0.30	0.20	Base	0.10	0.40	...	...
29 to 30	0.30	0.20	Base	0.10	...	...	...

BLACK EXTRAS FOR LENGTH

Gages	Under 30 inches to 18 inches	Under 60 inches to 30 inches	60 inches to 124 inches	Over 124 inches to 144 inches
10 to 16	0.15	0.10	Base	Base
17 to 18	0.25	0.15	Base	0.10
19 to 21	0.25	0.15	Base	0.10
22 to 24	0.25	0.15	Base	0.10
25 to 30	0.30	0.20	Base	0.10

Galvanized Sheets

Gage Differentials

Gage	Price per 100 pounds
30 Add	$0.50
29 Add	0.25
28 (Carload quantities)	Base
27 Deduct	0.15
25-26 Deduct	0.30
22-24 Deduct	0.45
17-21 Deduct	0.60
15-16 Deduct	0.75
12-14 Deduct	0.90
10-11 Deduct	1.00

GALVANIZED EXTRAS FOR WIDTH

Gages	Under12 inches to 6 inches	Under 24 inches to 12 inches	24 inches to 32 inches	Over 32 inches to 36 inches	Over 36 inches to 40 inches	Over 40 inches to 42 inches	Over 44 inches to 44 inches	Over 48 inches to 52 inches	Over 52 inches to 54 inches
10 to 15	0.25	0.20	Base	Base	Base	0.10	0.20	0.30	0.40
16	0.25	0.20	Base	Base	0.10	0.10	0.20	0.35	0.50
17 to 17	0.30	0.20	Base	Base	0.10	0.10	0.20	0.35	0.50
19 to 21	0.30	0.20	Base	Base	0.20	0.30	0.40	0.50	0.75
22 to 24	0.30	0.20	Base	Base	0.20	0.40	0.60	...	...
25 to 26	0.35	0.25	Base	Base	0.30	0.60	...	...	...
27	0.35	0.25	Base	0.10	0.50	0.75	...	...	...
28	0.35	0.25	Base	0.20	0.60	...	...	...	...
29 to 30	0.35	0.25	Base	0.20	...	...	...	...	...

GALVANIZED EXTRAS FOR LENGTHS

Gages	Under 30 inches to 18 inches	Under 60 inches to 30 inches	inches 60 to 124 inches	Over 124 inches to 144 inches	Over 144 inches to 168 inches	Over 168 inches to 180 inches	Over 180 inches to 192 inches	Over 192 inches to 216 inches	Over 216 inches to 228 inches
10 to 12	0.20	0.10	Base	Base	0.50	0.60	0.60	0.75	1.00
13 to 14	0.20	0.10	Base	Base	0.50	0.75	0.75	1.00	1.50
15 to 16	0.20	0.10	Base	Base	0.50	0.75	...	...	...
17 to 24	0.30	0.20	Base	0.10	...	...	...	...	...
25 to 30	0.35	0.25	Base	0.10	...	...	...	...	...

Blue Annealed Sheets

GAGE DIFFERENTIALS

Gage	Price per 100 pounds
8 and heavier	Less $0.05
9 and 10, carload quantities	Base
11 and 12	0.05
13 and 14	0.10
15 and 16	0.20

EXTRAS FOR WIDTH

Gage	Extra per 100 pounds
16 and heavier under 24 to 12-inch	$0.10
16 and heavier under 12 to 6-inch	0.15
16 and heavier under 24-inch and wider	None

EXTRAS FOR LENGTH

Gage	Extra per 100 pounds
16 and heavier, 60-inch and longer	None
16 and heavier, under 60 to 30-inch	0.10
16 and heavier, under 30 to 18-inch	0.15
Deoxidizing	0.15
Extra deep stamping or drawing	0.50

STANDARD MISCELLANEOUS EXTRAS

	Extra per 100 pounds
Blued range steel	$0.70
Blued range steel patent leveled	0.95
Blued stove pipe stock, 25 gage and lighter	0.20
Blued stove pipe stock, 24 gage and heavier	0.50
Enameling stock, pickled and annealed finish	0.50
Deep stamping or drawing	0.25
Extra deep stamping or drawing	0.50
Extra box anneal	0.15
Full cold rolled and reannealed	0.25
Full pickled, full cold rolled and reannealed	0.75
Lime finish	0.10
Long ternes, special finish	0.75
Oiling	0.10
Patent or stretcher leveling	0.25
Pickled, annealed, cold rolled and reannealed for tinning	0.50
Resquaring, 5% of price of sheet at time of resquaring.	
Roller leveling	0.10
Single pickled	0.45
Single pickled, cold rolled and reannealed	0.50
Single pickled, oiled or lime finish	0.55
Carbons over 0.25 to 0.40 per cent	0.10
Carbons over 0.40 to 0.60 per cent	0.25
Carbons over 0.60 to 0.90 per cent	0.40
First grade metal furniture stock, full pickled, full cold rolled, reannealed, stretcher leveled, not resquared	1.00
Second grade metal furniture stock, single pickled, full cold rolled reannealed, stretcher leveled, not resquared	0.85

Automobile Sheets

	Primes with seconds up to 15% per 100 lbs.
Automobile body stock	Base, 22 gage
Auto body stock, deep stamping	0.25
Auto body stock, extra deep stamping	0.50
Hood, flat fender, door and apron, or splash guard stock	0.25
Crown fender, cowl and radiator casing, deep stamping	0.50
Crown fender, cowl and radiator casing, extra deep stamping	0.75

Price of seconds, 10 per cent less than the invoice price for corresponding primes.

EXTRAS FOR EXTREME WIDTHS

	Per 100 lbs.
10-16 gage over 36 inches to 44 inches	0.10
10-16 gage over 44 inches to 48 inches	0.35
10-16 gage over 48 inches to 52 inches	0.50
17-18 gage over 36 inches to 44 inches	0.10
17-18 gage over 44 to 48 inches	0.20 to 0.35
17-18 gage over 48 inches to 52 inches	0.60
18 gage and heavier under 24 to 12 inches	0.15
18 gage and heavier under 12 to 6 inches	0.25
19 gage and lighter under 24 to 12 inches	0.15
19 gage and lighter under 12 to 6 inches	0.25
19-21 gage over 36 inches to 44 inches	0.30
19-21 gage over 44 inches to 48 inches	0.50
22-24 gage over 36 inches to 40 inches	0.40
22-24 gage over 40 inches to 44 inches	0.80

Black sheet extras to apply on narrow widths.

EXTRAS FOR LENGTHS

	Price per 100 pounds
16 gage and heavier over 60 inches to 144 inches	Base
16 gage and heavier under 60 inches to 30 inches	$0.10
16 gage and heavier under 30 inches to 18 inches	0.15
17 to 24 gage over 24 inches to 144 inches	0.10
17 to 24 gage under 60 inches to 30 inches	0.15
17 to 24 gage under 30 inches to 18 inches	0.25
25 gage and lighter over 24 inches to 144 inches	0.10
25 gage and lighter under 60 inches to 30 inches	0.20
25 gage and lighter under 30 inches to 18 inches	0.30